COMPARING RESOURCE-ALLOCATION PRACTICES ON STUDENT PERFORMANCE BETWEEN CHARTER PUBLIC SCHOOLS AND TRADITIONAL PUBLIC SCHOOLS

by

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Table of Contents

Abstract

In response to an education-market demand to provide equitable solutions for underserved populations, the State of Michigan passed legislation that created public school academies (i.e., charter public schools) to leverage marketplace competition that addresses supply and demand among high-quality schools. Detroit, Michigan, has a large number of urban low-performing charter and traditional public schools (Joy & Arellano, 2016). Overall, this study seeks to compare charter and traditional public schools in an urban context by examining differences in resource allocation to determine which model is producing better outcomes for student growth and proficiency. This exploratory study will use financial reports and state-assessment data from charter and traditional public schools to compare resource-allocation practices, thereby measuring educational-service efficacy through multiple variables, contributing to marketplace solutions that aim to ensure quality education in economically disadvantaged areas.

Acknowledgements

The dissertation process provided context for deep process development, critical analysis, bridging research and practice, and the procedures needed to being research. The process was challenging and expanded thought processes as well as training to approach writing differently. The thought-provoking nature of the process and the deep analysis of several studies relative to the topic provided a new way to view data and analysis in addition to current knowledge and skills. The process did not come without challenges. The challenges were understanding the writing process as it relates to the dissertation process and the overall data collection. The writing process is more repetitious and succinct simultaneously. Also, the data collection for this study was a major challenge. Initial data became unavailable from the clearinghouse for the original purpose of this study.

The support during this process has been extremely beneficial. Thank you to the dissertation committee for sharing and using expertise to ensure the effectiveness of this overall study. Chair, Dr. Mary Jo Finney, provided concise feedback in the review of the initial and final drafts, made impactful suggestions that guided the research rationale, challenged initial ideas of the initial study, provided moral support during challenging periods and unforeseen issues, and provided an insurmountable amount of technical guidance. Committee members, Dr. Phillip Caldwell, II and Dr. Matt Wyneken provided critical feedback and concepts as subject matter experts, pressed for deeper thought on the topic, provided meaningful feedback as it relates to statistics, figures, equations, and peer-reviewed research that supports the study. Peer reviewed research studies support the ideas within this study.

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List of Tables

List of Figures

Chapter I: Introduction

Introduction

African American student achievement nationwide has been an ongoing issue for the past four decades, with achievement rates continuing to decline (Lacireno-Paquet, Holyoke, Moser, & Henig, 2002; U.S. Department of Education, n.d.; Binelli, 2017). Public schools have been challenged with providing equity to persistently low-achieving students in poor, urban areas like Detroit, Michigan, with its large population of African American students (Binelli, 2017). Challenges in serving these students include inequitable funding systems that negatively impact school districts, as well as resource-allocation practices that can negatively impact student performance (U.S. Department of Education, 2011).

One solution attempted in several districts nationwide to improve and address inequities in funding systems and resource-allocation practices is the introduction of marketplace competition in the form of charter public schools to compete with traditional public schools (Arsen & Ni, 2012). Charter public schools have been promoted as a solution to improve disadvantaged students' achievement and provide an equitable approach to educating students at lower costs compared with traditional public schools (Michigan Legislature, 1993; National Alliance for Public Charter Schools, 2011). Charter public schools serve a substantial amount of African American students nationwide, but also place a financial strain on traditional public schools due to funding connected to student-enrollment volume (Lacireno-Paquet, Holyoke, Moser, & Henig, 2002; National Association for the Advancement of Colored People, 2017). This study examines whether charter public schools' resource-allocation practices are improving

students' performance and whether those improvements are with the same or fewer resources compared with traditional public schools in Michigan.

Equity. Equity has been an ongoing issue for Michigan's historically low-achieving student population for decades, which are African American students, and charter public schools mainly serve the African American student population (Lacireno-Paquet, Holyoke, Moser, & Henig, 2002; U.S. Department of Education, n.d.; Binelli, 2017). *Equity*, in this context, is defined as fair and equal access to quality and well-resourced education that ensures all children can succeed despite cultural or socio-economic conditions (U.S. Department of Education, 2005). This extends to children from underserved populations and communities that lack robust access to educational opportunities in safe, supportive, well-resourced schools (U.S. Department of Education, n.d.). *Underserved populations* refer to students who historically show low proficiency rates on state assessments in connection with various factors such as poverty, disabilities, or language barriers (U.S. Department of Education, 2005). Equity supports a minimum standard of access to education for all students (U.S. Department of Education, n.d.). In underserved populations, equity is impacted not only by the amount of federal, state, and local resources allocated, but also by each school district's resource-allocation practices (Field, Kuczera, & Pont, 2008).

Resource allocation. *Resource allocation* in a general educational context refers to how fiscal and non-fiscal resources are divided among instruction, operation, and facilities management, and how these competing needs are used for educational purposes (Pan, Rudo, Schneider, & Smith-Hansen, 2003). Resource allocation, in the context of school districts, is the process of deciding where funds are distributed to improve student performance (U.S. Department of Education, 2011). Serving persistently low-performing students presents

challenges not only tied to inequitable funding systems that negatively impact school districts, but also from resource-allocation practices that can impact student performance negatively (U.S. Department of Education, 2011).

Combatting inequity in funding systems. One approach to addressing schools' practices in using and shaping resources has been to increase funding to counter inequitable funding systems. The federal government expanded access to school funding with the Elementary and Secondary Education Act (ESEA) in 1965, a law that introduced additional funding through what is commonly known as Title I, Part A, funds to assist disadvantaged populations that include special-needs, homeless, migratory, and traditionally underperforming children in an effort to reduce inequities.

Title I, Part A (Title I), in the ESEA (amended) provides additional funding to local education agencies (public schools) that serve high numbers of children from low-income families to help ensure that all children meet state academic standards. Funds are allocated through a formula based primarily on U.S. Census poverty approximations and the cost of education in each state (U.S. Department of Education, n.d.). Poverty approximations are measured by using percentages of students in free and reduced lunch programs (U.S. Department of Education, 2011). The question is has the policy changes met or exceeded the expectations in equitable resource-allocation practices for better student performance in charter public schools compared with traditional public schools (National Center for Education Statistics, 2013; Nation's Report Card, 2015). Further amendments of the ESEA includes the No Child Left Behind Act (NCLB, 2002) and the Every Student Succeeds Act (ESSA, 2015).

Policy Changes to Traditional Public School Models

Traditional U.S. public school funding and resource-allocation models have been criticized over the past two decades for lacking flexibility and autonomy for schools to be innovative in resource-allocation practices (National Alliance for Public Charter Schools, 2011; Arsen & Ni, 2012). A level of flexibility currently is afforded to public schools in states with local control districts, which are state education agencies or departments of education that respect local school board officials' authority to operate their schools independently within the confines of statutes and regulations (Michigan Department of Education, 2017), i.e., the education departments are not involved in the schools' day-to-day operations.

However, critics of traditional public school funding and resource-allocation practices support removing the district layer and allowing for school-based management (National Charter School Resource Center, 2013). The traditional school district generally manages all funding with little input from schools within the district, which is a major criticism of the traditional public school system. This criticism helped spark the concept of decentralizing districts' central administration to change resource-allocation practices, promoting more efficient uses of resources, and adding more flexibility to use these resources (Arsen & Ni, 2012). The concept of more flexibility and autonomy is a key factor in policy changes that seek to equalize school funding for underserved populations (Arsen & Ni, 2012; Dorsey & Plucker, 2016).

Over the past three decades, public school education has experienced various policy changes (e.g., ESEA, NCLB, and ESSA). ESEA reauthorizations have introduced innovative concepts, such as school choice through the NCLB law and its replacement, the ESSA Act (Dorsey & Plucker, 2016). School choice includes homeschooling, private schools, and voucher programs. The more impactful school-choice option included in NCLB and the latest iteration,

ESSA, is the Promoting Informed Parental Choice and Innovative Programs (Part B), which promotes charter public schools (Geske, Davis, & Hingle, 1997; U.S. Department of Education, 2002).

The current U.S. political and economic climate supports school-choice policies that include decentralization of districts and marketplace competition (Dorsey & Plucker, 2016). Supporters of charter public schools believe that school choice is better for underserved populations, and that charter public schools provide flexibility to improve student achievement (National Alliance for Public Charter Schools, 2017). In the past two decades, marketplace competition through charter public schools has entered the education climate to compete with traditional public schools.

Marketplace competition. *Marketplace competition* refers to an economic system based on supply and demand to satisfy consumers' needs (Preston, Goldring, Berends, & Cannata, 2012; Redmond, 2013; Harris, 2017). With the introduction of charter public schools, the theory is that charter public schools would force traditional public schools to be more innovative or otherwise make improvements in the face of competition (Waslander, Pater, & Van der Weide, 2010; Redmond, 2013). The concept asserts that parents can benefit consistently from market participation, with competition viewed as beneficial for parents, forcing schools to improve their practices to compete within the market (Redmond, 2013). The addition of school choice sought to provide a flexible and autonomous model to underserved populations in need of innovative and high-quality approaches to education, with the goal of improving student performance with the same or fewer resources (CATO, 2018).

Marketplace competition in Michigan. The State of Michigan changed its public school education landscape with the introduction of its marketplace-competition policy in 1993. In an

attempt to equalize school funding, provide a model to decentralize funding at the district level, and improve proficiency within historically underserved student populations, the charter public school was introduced (Office of Revenue and Tax Analysis Michigan Department of Treasury, 2002; Michigan Department of Treasury, 2002). The rationale for charter public schools in Michigan is to aid underserved populations in need of different approaches to improve student proficiency (Loeb & Cullen, 2004).

Michigan school districts exert local control, and charter public schools expanded this local control by decentralizing the traditional district approach to maximize flexibility in supporting and seeking opportunities for innovation (U.S. Department of Education, 2005; Michigan Department of Education, 2017). Charter public schools were expected to innovate and introduce new resource-management concepts into the traditional public school system (National Association for the Advancement of Colored People, 2017). Michigan's charter public schools received greater flexibility at the school level in design and operations (Michigan Department of Treasury, 2002; House Fiscal Agency, 2016). Charter public schools are believed to have a greater ability to pilot various systems of support, use different grade-level configurations to determine whether they are more effective, utilize the same or fewer resources for greater outcomes compared with traditional public schools, and impact student proficiency better than traditional public schools (Loeb & Cullen, 2004; CATO, 2018). With the introduction of this policy in Michigan, charter public schools now serve over 10 percent of the student population; over 90 percent of charter public schools are for-profit, attended mostly by African American students; and a significant number of charter public schools operate in the Detroit metropolitan area (MI School Data, 2018).

The policy has impacted the public-education landscape in Michigan, especially in the

City of Detroit (Loeb & Cullen, 2004; Arsen & Ni, 2012; Data Driven Detroit, 2012). The competition was intended to create a better school model that includes improved funding and resource allocation (National Alliance for Public Charter Schools, 2011). Detroit has a history of inequitable funding and an underserved population (Council of Great City Schools, 2008). In the past decade, Detroit has experienced bankruptcy, massive job losses, mismanagement of funds, population decline, and an increased number of children living in poverty, which adversely impacts schools (Council of Great City Schools, 2008). The demographics make the city an appropriate environment in which to examine Michigan's policy efficacy on student performance because of persistently low achievement among African Americans in Michigan (National Center for Education Statistics, 1996; U.S. Department of Education, 1996; Kids Count in Michigan Data Book, 2018).

Marketplace competition in Detroit. For context, Detroit is an urban environment with a large population of urban students living in poverty (Kids Count in Michigan Data Book, 2018). Urban students are more likely than other student populations to live with an absence of family structure, low economic security, limited education, and instability associated with less-than-desirable education outcomes (National Center for Education Statistics, 1996; U.S. Department of Education, 1996). The strain on city resources has impacted Detroit Public Schools Community District (DPSCD), formerly Detroit Public Schools, with the district having experienced multiple state takeovers, dissolution of a publicly elected school board, loss of resources, loss of teachers, and mismanagement of funds (Lake, Jochim, & DeArmond, 2015). Amid these challenges, Detroit schools are serving a large number of children living in poverty (U.S. Department of Education, 2017), and the responsibility falls on these schools to support these students.

Detroit ranked third nationwide in the percentage of students attending charter public schools, at 53 percent (National Alliance for Public Charter Schools, 2011). The city has the largest percentage of students attending charter public schools and the largest number of charter public schools in Michigan (National Association for the Advancement of Colored People, 2017; MI School Data, 2018). This proliferation of charter public schools has been impacting the city's traditional public school district financially, as decreased enrollment has elicited less funding (Loeb & Cullen, 2004). Charter and traditional public schools must compete for the same financial resources, and a major concern is that the market may produce the same kinds of resource-allocation models that the policy was intended to eliminate (Chang, May, Maloney, Batdorff, Wolf, & Speakman, 2014).

Since implementation of school policy changes that created marketplace competition, student performance has been examined using national, state, and local data, with mixed results reported (Bettinger, 2005; Center for Research on Education Outcomes, 2013; University of Michigan, 2016). The Michigan Department of Education (MDE) and the Michigan Association of Public School Academies (MAPSA) both used the Center for Research on Education Outcomes (CREDO) (2013) study to support the idea of marketplace competition and the positive impact from charter public schools. The study found significant gains in reading and math among students attending urban charter public schools compared with traditional public schools.

Alternatively, the research team of Adamson, Cook-Harvey and Darling-Hammond (2015), using the CREDO (2013) methodology, examined New Orleans, Louisiana on the heels of Hurricane Katrina, in 2005. The toll of the storm include lost lives, destroyed property, and the displacement of large numbers of people, most of them low-income people of color

(Adamson, Cook-Harvey, & Darling-Hammond, 2015). The introduction of charter public schools was to repair the educational system by creating an educational environment featuring multiple superintendents, boards of education, approaches to school admissions and operations, curriculum, instruction, and student discipline (Adamson, Cook-Harvey, & Darling-Hammond, 2015). The research found that, "New Orleans charter public school reforms have created a set of schools that are highly stratified by race, class, and educational advantage, operating in a hierarchy that provides very different types of schools and to different types of children" (Adamson, Cook-Harvey, & Darling-Hammond, 2015, p. 47). Not all students have choice in the system. For those that do not, "both access and educational quality differ substantially, with the most vulnerable students least likely to experience the stability and supportive environments they need" (Adamson, Cook-Harvey, & Darling-Hammond, 2015, p. 22).

The Adamson et al. study (2015) also found that participant demographics were different in comparison to the CREDO (2013) study. CREDO (2013) excluded most traditional public schools because it only matched charter public school students to schools that are direct feeder schools to those particular charters, used only traditional public schools that students left to attend charter public schools, and its methods failed to model both individual student growth and school-level effects directly (Maul & McClelland, 2013; Adamson, Cook-Harvey, & Darling-Hammond, 2015).

Bettinger (2005) examined charter public schools' impact through a state lens, and the University of Michigan (2016) studied charter public schools' impact through a local lens. Both studies found no significant differences in outcomes and structure between charter and traditional public schools. The clear fact is that student performance in Detroit has not improved since school policy changes dating back to the last funding structure for schools, or since the Bettinger

(2005) study of charter public schools that provided a comparison with traditional public schools (Bettinger, 2005; Lewis, 2015).

Problem Statement

In Michigan, legislators supported the idea of investing in a new method to support children beyond the traditional public school model believed to be failing (Michigan Legislature, 1993). Marketplace competition through Michigan's legislation was meant to be a solution to inequities by improving overall resource-allocation practices to boost student performance (Lacireno-Paquet, Holyoke, Moser, & Henig, 2002; Mendez, 2004; Binelli, 2017). However, marketplace-competition research that has examined Detroit charter and traditional public schools has found either only marginally higher performance or no statistically significant improvements in student performance at charter and traditional public schools (Center for Public Education, 2017). Yet, Michigan has not improved equity in the distribution of education resources, including uniformity of facilities and environments, equal funding, and equal access to educational opportunities for all students (Loeb & Cullen, 2004; Pan, Rudo, Schneider, & Smith-Hansen, 2003).

African American students' performance has continued to trend downward for the past two decades, and this downward pattern has been linked to inequities in funding and resource allocation (Pan, Rudo, Schneider, & Smith-Hansen, 2003; U. S. Department of Education, 2017). Equity has been an ongoing issue for Michigan's historically low-achieving population for decades, and charter public schools serve a vast majority of the African American student population (Lacireno-Paquet, Holyoke, Moser, & Henig, 2002; U.S. Department of Education; Binelli, 2017). More specific to this study, students consistently perform poorly in Detroit since the inception of marketplace competition (Nation's Report Card, 2015).

Importance of Study

Michigan introduced a policy that supported marketplace competition to provide high-quality options to low-income families, revitalize the traditional public school system, use flexible resource-allocation practices to yield better results for students, and produce cost savings to state education agencies (Michigan Legislature, 1993). This study shall investigate resource allocation between charter and traditional public schools using Detroit, which comprises a large number of charter and traditional public schools serving disadvantaged students and can serve as a case study for determining the differences in school resource-allocation models to elicit more research (Loeb & Cullen, 2004).

This study examines whether charter public schools' resource-allocation practices are improving students' performance and whether any improvements have been accomplished by using the same or fewer resources, compared with traditional public schools. Currently, school districts use divergent practices to examine resource-allocation efficiency and, thus, their measurements may differ significantly across each practice (Gronberg, Jansen, Taylor, & Booker, 2005; Augenblick, Palaich, & Associates Inc., 2016).

Similar to the ways in which the business sector uses return on investment (ROI), education uses performance measures to determine the efficiency of an investment, i.e., ROI. Those performance measures may differ for each school system (Gronberg, Jansen, Taylor, & Booker, 2005; Augenblick, Palaich, & Associates Inc., 2016). Efficiency in ROI is a level of performance that describes a process in which the lowest amount of effort is used to create the greatest output (Investopedia, n.d.; Pan, Rudo, Schneider, & Smith-Hansen, 2003; Lynch, 2016). ROI measures the amount of return on an investment's cost. Education uses ROI to measure the efficiency or efficacy of resource allocations such as teaching and support staff, educational

programs, an educational process, or an educational service (Pan, Rudo, Schneider, & Smith-Hansen, 2003). Education services are those that provide instructional services, operational services, and facilities management (Gronberg, Jansen, & Taylor, 2012).

Detroit charter and traditional public schools serve a student body that is over 90 percent African Americans and highly economically disadvantaged as defined by Title I funding levels, which include basic, concentration, targeted, and financial-incentive education grants (U.S. Department of Education, 2016). Figure 1 represents the four levels of Title I funding disbursed, based on the percentage of students in free and reduced-price lunch programs.

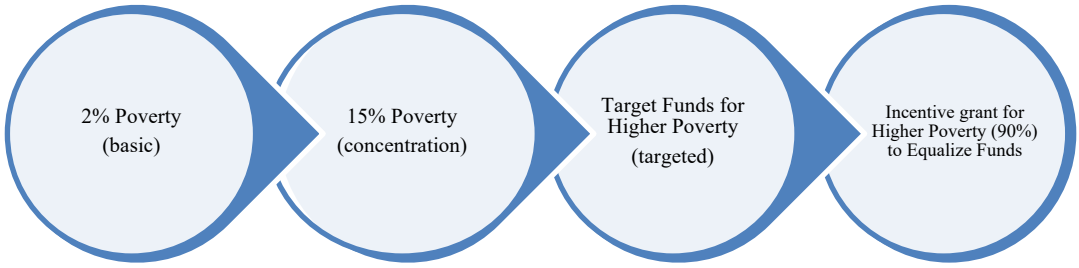

Figure 1. Title I Allocations, U. S. Department of Education, 2016.

Overall research concerning marketplace competition in Michigan has focused on student performance only versus student performance and effectiveness in resource allocation of education services (Murray, 2011). Furthermore, there exists a limitation in the research literature for Michigan with respect to resource-allocation variation. Thus, examining charter and traditional public schools' ROI is needed to identify the policy's efficacy in terms of improving resource-allocation practices, as well as those practices' outcomes on student performance (Pan, Rudo, Schneider, & Smith-Hansen, 2003; Gronberg, Jansen, Taylor, & Booker, 2005; Murray,

2011; Gronberg, Jansen, & Taylor, 2012). The measure of efficiency between charter and traditional public schools can determine whether the charter public school model improves resource allocation or whether Michigan policy has created more of the same traditional public school model (Geske, Davis, & Hingle, 1997; Gronberg, Jansen, & Taylor, 2012), thereby adding further strain to the education marketplace. The significance of this study is to contribute to the field a context as to whether the policy that introduced charter public schools is meeting its objectives effectively.

Research Questions

Based on the review of relevant literature, there exists a need for further exploration that examines charter and traditional public schools with respect to their variances in resource-allocation relative to student performance outcomes as determined by their respective ROI (Pan, Rudo, Schneider, & Smith-Hansen, 2003; Gronberg, Jansen, & Taylor, 2012). More specifically, charter and traditional public schools' resource-allocation practices was analyzed for allocation efficacy as quantified by the education services, including instruction, operations, and facilities management in relationship to student performance.

As the largest city in Michigan, with the largest ratio of charter and traditional public schools (Gawlik, Kearney, Addonizio, & LaPlante-Sosnowsky, 2012), Detroit provided this study with a data-rich context from which to investigate, primarily, whether differences exist between charter and traditional public schools regarding their distribution of resources, and secondarily, whether spending practices promote different student performance outcomes. To address these foci, the following questions were considered:

(1) Comparing charter and traditional public schools, is there a difference in student proficiency?

(2) Comparing charter and traditional public schools, is there a difference in student growth?

(3) Comparing charter and traditional public schools, is there a difference in impact from total revenue on student proficiency and growth?

(4) Comparing charter and traditional public schools, is there a difference in impact from total expenditures on student proficiency and growth?

(5) Comparing charter and traditional public schools, is there a difference of return on investment?

Chapter 2: Literature Review

Introduction

The review frames the relevant literature leading to the progression of Marketplace competition adaptation in the State of Michigan. *Marketplace* or *free-market competition* is an economic system based on supply and demand to satisfy a large number of consumers' (in this context, parents and students) wants and needs (Harris, 2017). Marketplace competition in education seeks to equalize education and provide the best opportunities for all children (Dorsey & Plucker, 2016), and this competition is in the form of charter public schools to provide high-quality options to disadvantaged populations of students (Arsen & Ni, 2012). The overarching question is whether marketplace competition is promoting high-quality options and equity in disadvantaged areas.

High quality. Each state is responsible for developing a definition of high-quality charter public schools that can impact underserved populations due to differences in states' laws and performance measures (U.S. Department of Education, 2005). Based on the Federal Registry (Vol. 76, No. 58), *high quality* is defined as showing evidence of strong academic student performance for the past three years, or over the life of the school if the school has been in operation for fewer than three years. High quality meets the following criteria: increasing student performance, particularly in disadvantaged areas; closing achievement gaps; achieving results for low-income and educationally disadvantaged groups; and ensuring that no compliance issues exist concerning financial management and student safety. The definition's intent is for students to gain access to quality education (U.S. Department of Education, 2005; Senators Introduce Update to Charter School Program, 2011).

The federal government budgets annual funds to support the pursuit of high-quality education. Such federal aid includes financing for charter public school facilities, encouraging states to ensure access to suitable facilities, replicating high-quality schools, and providing grant competition for states to support placing schools in high-need areas (U.S. Department of Education, 2005; Senators Introduce Update to Charter School Program, 2014). A high-quality charter school seeks to prioritize support for special populations, including at-risk students, students with disabilities, and non-native English learners (Senators Introduce Update to Charter School Program, 2014). While the federal government has provided a basic framework, some models have been developed in high-need areas that exceed minimum federal criteria.

High-quality charter public schools in disadvantaged areas. According to Brighouse and Schouten (2014), several characteristics need to be considered when deciding to charter a school for disadvantaged students (i.e., those living with poverty, disabilities, low income, English-language barriers, homelessness, etc.). These characteristics are believed to promote high-commitment charter (HCC) public schools that attract talented teachers with the purpose of enhancing students' daily lives with adequate and equitable funding. To reiterate, *equity* is the fair distribution of educational resources (including uniformity of facilities and environment, equal resource inputs, and equal access) for all students (Loeb & Cullen, 2004; Pan, Rudo, Schneider, & Smith-Hansen, 2003). Having an HCC commitment and adequate funding provides the tools for a charter public school to be successful in a disadvantaged area (Brighouse & Schouten, 2014). An HCC supports stakeholders in deciding to open a charter public school for educationally disadvantaged groups (Brighouse & Schouten, 2014; Center for Public Education, 2016).

HCCs embrace a social and educational mission to provide high-quality education to disadvantaged students despite resource issues. The focus is geared toward improving students' prospects, including college and career readiness, income, and social status (Brighouse & Schouten, 2014). These schools try to eliminate social inequities by improving educational achievement. HCC examples include organizations such as the Knowledge Is Power Program (KIPP), National Heritage Schools, and Schools for Educational Evolution and Development (SEED). These groups help create schools that stress character, citizenship, partnerships with families and communities, rigorous curricula, and strong teachers (Brighouse & Schouten, 2014; KIPP, n.d.; SEED Foundation, n.d.).

HCCs in disadvantaged areas focus on citizenship and are intended to enhance students' daily lives (Brighouse & Schouten, 2014). Their focus includes providing a safe and nurturing environment in which to create productive citizens, thereby seeking to provide equity for a diverse population of students and a high-quality option for disadvantaged students. However, HCCs only can be effective in improving equity and social justice if policies and staff support the implementation of the HCC model (Brighouse & Schouten, 2014).

An HCC's purpose is to provide commitment and equitable funding for disadvantaged students to be successful. The model aligns with the high-quality charter-school definition that closes achievement gaps and promotes financial management and student safety (U.S. Department of Education, 2005). Various states have sought to use the high-quality model or HCCs to improve equity in public school education, including in the State of Michigan, which Michigan legislators supported policies and passed legislation over time to introduce its own model (Loeb & Cullen, 2004). This study compares charter and traditional public schools to investigate whether differences exist between charter and traditional public schools regarding

their distribution of resources, and whether spending practices promote different student performance outcomes.

Setting the Context. African American students comprise the most persistently low-achieving subgroup in Michigan, and this study uses Detroit, which has the largest concentration of low-performing African American students statewide, to study the impact of charter public schools' resource-allocation practices on student performance. This literature review provides extant research on African Americans' historical pursuit of equity in education, the federal government's equalization efforts, charter public schools' context, marketplace-competition outcomes, and extant studies examining student performance in Detroit.

History of African Americans Seeking Equity

Equity in education maintains that all students should have access to educational opportunities (Loeb & Cullen, 2004; Pan, Rudo, Schneider, & Smith-Hansen, 2003). Specifically, equity entails access to high-quality curricula, teachers, and a fair system of education (Center for Public Education, 2016). In the U.S., African Americans fought for decades after the Civil War to secure civil rights and equity that ultimately would impact education. During the Reconstruction Era (1863-1877), the nation tried to readjust after slavery's abolition, but boycotts took place between 1897 and 1925 in four major Northern cities with civil rights laws (Meier & Rudwick, 2006). These cities were Alton, Illinois; East Orange, New Jersey; Springfield, Ohio; and Dayton, Ohio (Meier & Rudwick, 2006; Mueller & Schamel, 1989; Crespino, 2003). The boycotts would be some of the first directed at K–12 education to obtain equity by the African American community. With boycotts came further challenges by African Americans to the system.

In 1892, Homer Plessy, being of mixed race, refused to sit in the railcar designated for

African Americans because of the proportion of Caucasian and African blood he possessed. His act of sitting in the Caucasian railcar was a crime. In the South, and specifically related to this case, Louisiana railways required separate railcar seating for white people and people of color. Essentially, people were assigned seating by race. After being arrested, Plessy went before the Honorable John H. Ferguson, a judge on the criminal district court in his New Orleans parish, and was convicted. The case was fought all the way to the Supreme Court. Plessy argued that the railcar policy violated the Thirteenth Amendment (forbidding involuntary service) and the Fourteenth Amendment (forbidding deprivation of citizens' privileges) (Jager, n.d.; Wishon, 2004).

On May 18, 1896, the Supreme Court ruled in favor of the defendant, which supported the existing separate-but-equal law, and against Plessy, ruling that "to enforce the absolute equality of the two races before the law…laws…requiring their separation do not necessarily imply the inferiority of either race" (Jager, n.d., p. 1). The impact of separate-but-equal laws would play a role in the history of African Americans as they tried to integrate throughout the South, where segregation already was a firmly established institution (Wishon, 2004).

Plessy v. Ferguson (163 U.S. 537) legitimized Jim Crow laws and helped form the foundation for laws that allowed racial separation, impacting schools, retail stores, hotels, entrances to establishments, public transportation, and other public facilities (Public Broadcasting Station, n.d.). "Jim Crow" was a negative term used to describe an African American man, based on the theory of white supremacy and a reaction to the Reconstruction Era (Constitutional Rights Foundation, n.d.; Meier & Rudwick, 2006). The name origin of Jim Crow is from the *Jump Jim Crow* minstrel routine that depicted African American as dim-witted buffoons and became the name of the laws to enforce white supremacy in the South after the

Reconstruction Era (Urosky, n.d.). Minstrel shows depicted the negative stereotypes of African American people to promote the culture as less than the white race (Urosky, n.d.; Kelly, 2012). The Jim Crow laws heightened the deterioration of conditions for African Americans (Kelly, 2012).

Jim Crow laws enforced segregation to the point that no racial equality in education existed. Again, segregation was an institution that primarily was ubiquitous in the South, whereas the North endured early boycotts over inequities in education, given the poor conditions within some African American school systems that included building quality, teaching materials, and other resources. Several cases laid the foundation for ending school segregation and pushing for equal rights to education.

Between 1936 and 1950, several U.S. court cases challenged inequality, but mostly at the higher-education level. The *Missouri ex rel. Gaines v. Canada* (1938) case involved Lloyd Gaines, a black graduate student who was denied admission to the University of Missouri School of Law by Silas Woodson Canada because of skin color. As the state did not have a black law school, it offered to pay for him to attend a black school elsewhere or build a school for black students. However, Gaines used the services of the National Association for the Advancement of Colored People (NAACP) Legal Fund to sue the state and won (Cornell Law School, n.d.).

Given the win for Gaines, the NAACP pursued the *Sweatt v. Painter* (1950) case. Heman Sweatt sued University of Texas President Theophilus Painter for setting up a black law school that was not equal to the white law school. The U.S. Supreme Court agreed, citing blatant inequality (Cornell Law School, n.d.). Another case involving the separate-but-equal mindset was *McLaurin v. Oklahoma State Regents* (1950). George McLaurin entered the doctoral program at the University of Oklahoma, but was required to sit apart from the rest of the class

and eat at a different time than white students (Cornell Law School, n.d.). McLaurin used the NAACP Legal Defense and Education Fund to argue his case. The U.S. Supreme Court sided with McLaurin, ruling that these practices impeded McLaurin's ability to learn. Each of these cases focused on education equity or opportunity (U.S. Courts, n.d.; Cornell Law School, n.d.) and laid the groundwork for the landmark ruling *Brown v. Board of Education* (347 U.S. 483, 1954) in Topeka, Kansas (Blight, 2002).

Brown involved Oliver Brown of Topeka, who sued the city school board because he wanted his daughter to attend the neighboring white school for better educational opportunities. Encouraged by the NAACP in 1951, Brown fought the case further after the state upheld the statutes, and the Supreme Court struck them down, thereby reversing *Plessy v. Ferguson* and separate-but-equal ideology. Chief Justice Earl Warren said that, as a result of this case, "In the field of public education, the doctrine of separate-but-equal has no place" (Wishon, 2004, p. 78). In 1960, *Brown* led to federal mandates that state and local governments must open their public schools to all students, aiming for true equity in resources and opportunities for success.

Federal Government and Equalization

After *Brown*, concern over equitable resources remained throughout the decade. President Johnson signed into law the Elementary and Secondary Education Act (ESEA) in 1965 (Klein, 2015), opening the door for federal government involvement in education policy in an effort to provide all students with equal access to education. Such involvement includes laying the foundation for academic standards and providing resources such as Title I-VII funding to assist disadvantaged students, focus on teaching and learning, and stress flexibility in student preparation (U.S. Department of Education, 1996; Klein, 2015).

ESEA appropriated large amounts of money toward education programs for students with special needs, such as homeless and migratory children. However, ESEA required reauthorization, i.e., the law must be reauthorized every five years (Irwin, 1992; Washington State School Directors' Association, n.d.). However, Congress failed to do so every year since 2006-07 (Washington State School Directors' Association, n.d.). Reauthorization is important as far as guaranteeing that funds (Title I-IV) for school systems are allocated. Specifically, Title I, (Part A) provides additional funding to public schools with high numbers of children from low-income families to help students meet state academic standards (U.S. Department of Education, n.d.).

With the introduction of Title I (Part A) funds received by schools through ESEA came the requirement of reporting school-level per-pupil education expenditures from state and local funds. Title I funding is disbursed based on the percentage of students in free and reduced-price lunch programs. The requirement is referred to as the American Recovery and Reinvestment Act of 2009 in Title I (U.S. Department of Education, 2011; U.S. Department of Education, n.d.). Before ESEA, no common reporting mechanism existed for school districts to examine resource-allocation practices and their impact on education services (U.S. Department of Education, 2011). While the federal government institutes requirements on how funds are reported and implemented, states are responsible for designing how school funds are allocated to districts. Specifically, districts control resource-allocation practices. Despite the increased funding, resource-allocation practices continue to impact underserved populations negatively because increased funding is based on state assessment results (Roza, Miller, and Hill, 2005; Roza, 2009; National Center for Education Statistics, 2013).

American Recovery and Reinvestment Act of 2009 Impact. The American Recovery and Reinvestment Act (ARRA) introduced funding programs such as grants for homeless students, special education, and innovation (Irwin, 1992). The ARRA stipulated that $5 billion in grants be allocated under section 1125 of the ESEA for incentive or targeted grants to schools, which are extra funds to help improve student performance (U.S. Department of Education, 2011). Of those funds, $3 billion was to be allocated specifically for school-improvement grants to support equity.

The ARRA also added the requirement of school districts to report per-pupil education-related expenditures to the U.S. Department of Education. This reporting requirement would be the first attempt to examine resource allocation practices of funds (Irwin, 1992) . The reporting instituted a mechanism to examine the equity of school-funding spending practices and to inform how school districts allocate funding with the grants (U.S. Department of Education, 2011).

During the 1970 reauthorization of Title I, Congress added a comparability requirement for Title I and non-Title I schools (U.S. Department of Education, 2011). The requirement is a comparison using “number of pupils per certified teacher; the number of pupils per other certified instructional staff, including principals, vice principals, guidance counselors, and librarians; the number of pupils per noncertified instructional staff, including secretaries, teacher aides, other clerical personnel; instructional salaries per pupil; and other instructional costs per pupil, such as textbooks, school library books, audio-visual equipment, and teaching supplies” (U.S. Department of Education, 2011, p. 2). The law required that schools develop a process for reporting and maintaining expenditure data. The data that were generated, as a result of the law, provided a context for comparing equitable resource-allocation practices for Title I and non-Title I schools.

Comparing Title I and non-Title I districts. A study conducted in 2005 found that in four (Austin, Denver, Fort Worth, and Houston) of the five districts studied, schools with the highest concentrations of students from low-income families received considerably less money from the school district's non-categorical or basic resources (Roza, Miller, & Hill, 2005; U.S. Department of Education, 2011). Dallas was the only city where spending practices aligned with schools in need. Using the comparability requirement, Roza et al. (2005) examined district budgeting practices that systematically favor schools with the fewest educational challenges and vague district fund-allocation practices that funnel Title I funds to schools in the wealthiest communities. The study provided context into variances in expenditure practices and equity in school districts.

In 2011, the U.S. Department of Education conducted a study to examine the per-pupil expenditure variance of state and local education expenditures within Title I and non-Title I high-poverty schools. The study's findings resembled those of Roza et al. (2005) in that between 42 percent and 46 percent of Title I schools had per-pupil expenditure levels that were below their districts' average for non-Title I schools. The result was a similar pattern when comparing higher- and lower-poverty schools within districts (U.S. Department of Education, 2011). The commonality between this study and that of Roza et al. (2005) is that districts are not allocating extra funding for schools based on students' needs. Thus, with increased funding allocated to underserved populations, students are not performing better (U.S. Department of Education, 2010). The studies highlighted school-funding and resource-allocation concerns in traditional public schools and highlighted the need for better ways to distribute and allocate funding in innovative ways.

In the wake of educational advances in other countries, the Nation at Risk report (1983) was released to indicate a need to restructure U.S. schools due to the literacy rate of Americans compared with other countries (U.S. Department of Education, 1983). The report would be used as a political tool to push for education reform at the local, state, and federal levels despite criticisms from education-community professionals (Gardner, 1984). The report also supported more federal government involvement to improve student performance compared with other nations, and President Reagan used the report to change the U.S. education system (Gardner, 1984). The next ESEA iteration would be No Child Left Behind (NCLB) in 2001, exposing the impact of such beliefs on education. NCLB has continued to be a call to arms for improving the U.S. education system.

NCLB increased the federal government's role in education through school accountability, i.e., schools would be held accountable for student performance and progress, especially for students of color, economically disadvantaged students, Non-native English-language learners, and special-education students. School districts would be in danger of losing Title I funding if these groups' performance did not improve (Klein, 2015). NCLB emphasized the flexibility of school choice, local control, and accountability options for parents, as well as report cards on school performance (U.S. Department of Education, 2003).

NCLB introduced the requirement that teachers be highly qualified, which applied to core academic subjects such as English (secondary), English language arts, reading, math, science, foreign languages, social studies, arts, history, and geography (Birman, Boyle, Le Floch, Elledge, Holtzman, Song, & Yoon, 2009). NCLB was instrumental in revising the educator certification (teacher, school administrator, etc.) system and required educator completion rates by colleges and universities that offered educator programs (U.S. Department of Education, 2003). NCLB

also designed standards for instructional paraprofessionals paid with Title I funds and required ongoing professional development for all teachers (U.S. Department of Education, 2003). The purpose was to improve teacher quality and retain teachers, especially in disadvantaged areas (Birman et al., 2009; Klein, 2015).

Included in NCLB was Title V, i.e., Promoting Informed Parental Choice and Innovative Programs (Part B), which outlined the purpose of charter public schools (Geske, Davis, & Hingle, 1997; U.S. Department of Education, 2002). State education agencies (departments of education) are responsible for making funds available to charter public schools, which then are expected not only to meet all students' needs, but also to support states' reform efforts, implement innovative education reforms based on sound research, and improve overall school, teacher, and student performance (U.S. Department of Education, 2002). NCLB's Title V (Part A) also included the Charter School Program Grant, which supports the creation, expansion, and replication of high-quality charter schools through funds (U.S. Department of Education, 2002).

Charter Public School Context. The original idea for school choice was shaped by Ray Budde, a school principal and part of the University of Massachusetts faculty, as early as 1974 (Kolderie, 2005). Essentially, the concept involved more flexibility to operate and change public schools' overall structure. His original concept for the alternative school centered on changing the way school boards operate, redefining teachers and school administrators' roles, involving all stakeholders (parents, teachers, administrators, counselors, etc.) in the curriculum process, and providing ongoing curriculum updates to promote autonomous curriculum units (Little Hoover Commission, 1996; Kolderie, 2005).

Budde's ideas prompted those in favor of school reform to seek changes. The most influential individual to advocate for Budde's idea was Albert Shanker, president of the

American Federation of Teachers (Kolderie, 2005). Shanker supported the Nation at Risk report and used the report to support school choice in the 1980s, a period of major education reform during which time, Shanker was prominent (Little Hoover Commission, 1996; Kolderie, 2005). His lobbying for school choice was successful as the charter public school model strengthened through NCLB in 2001.

Charter public school design. Charter public schools are public schools that operate independently of traditional public schools and are designed to meet students' needs in a specialized way (Center for Public Education, 2017). The first charter public school laws were passed in Minnesota in 1991 and spread to more than 43 states by 2009 (Blazer, 2010). Each state has specific laws that govern their charter public schools (Blazer, 2010). Such differences among states include what entity operates charter public schools and how many charter public schools may operate in a state (U.S. Department of Education, 2003; Shealey, Sparks, & Thomas, 2012; Center for Public Education, 2017). Depending on the state, charter public schools may have flexibility in providing instruction, budgeting, resource allocation, creating varied grade-level configurations that best meet students' educational needs, providing a cyber-school format, and supporting both blended learning and brick-and-mortar schools (National Alliance for Public Charter Schools, 2011; Murray, 2011).

Charter public-school management companies. Charter public schools are intended to support populations of students that traditional schools have not served and seek to be a site-based management model independent of traditional public schools' one-size-fits-all model (National Alliance for Public Charter Schools, 2011; U.S. Department of Education, 2003; Lacireno-Paquet, Holyoke, Moser, & Henig, 2002; Blazer, 2010; Winters, 2012). The site-based management model refers to two options: Charter public schools can be single-site schools or

operated by a management company, also known as an education management organization (EMO), which is for-profit, or a charter management organization (CMO), which is nonprofit. Examples of EMOs include National Heritage Academies, the Leona Group, and the Hanley Group. Examples of CMOs include national organizations such as the Knowledge Is Power Program (KIPP), Aspire, Responsive Education Solutions, and Summit Academy Management (National Alliance for Public Charter Schools, 2011; National Alliance for Public Charter Schools, 2015). Their purpose is to de-centralize schools' governance and operations by increasing their autonomy and flexibility (National Association of Charter School Authorizers, 2011; Levin, 2012). This flexibility and autonomy include school location, fewer administrative restrictions on how to utilize funds, and less authorization needed to make decisions. The Every Student Succeeds Act (ESSA) reauthorized ESEA in 2015, and it maintains previous laws that govern charter public schools. ESSA allows parents to choose other public schools if schools in their area are poorly performing or unsafe (U.S. Department of Education, 2002).

State of Michigan equalization. Michigan previously passed legislation that attempted to eliminate inequities in school financing in the early 1970s. The Michigan Public Act of 1971, Act 101, mandated that the state legislature maintain and support the state's education system. Under the State Board of Education's general supervision, the state-controlled school districts' boundaries, and schools were financed based on locality (*Milliken v. Bradley*, n.d.; 1974; Senate Fiscal Agency, 1995). Michigan switched from a modified foundation allowance to a power-equalization funding model in 1973. Power equalization allowed districts to set a guaranteed tax base for school funding (Loeb & Cullen, 2004; Joy & Arellano, 2016).

The power-equalization model allowed for state aid to supplement revenue collected under property taxes, or *millages*, and provided the difference between funding raised locally and

funding raised with the same tax rate applied to the guaranteed base, since property taxes in Michigan accounted for a high fraction of state and local revenue (Senate Fiscal Agency, 1995; Loeb & Cullen, 2004). The result was further inequities in school funding for underserved populations because the pressure on the amount of property tax that residents paid increased (Senate Fiscal Agency, 1995; Loeb & Cullen, 2004).

Landmark Michigan cases. In a landmark decision, Act 101 helped lead to the Supreme Court's ruling in *Milliken v. Bradley* (418 U.S. 717, 1974) in which the court ruled that students could not be bused between Detroit and its suburbs to remedy racial imbalances. *Milliken* was a significant Supreme Court case dealing with attempted desegregation of public schools across district lines among 53 school districts in metropolitan Detroit. The case alleged that the Detroit public school system was segregated racially due to state and city officials' policies and actions, thereby impacting equity (Justia, n.d.). The case sought to implement a plan to eliminate segregation in Detroit public schools under *Brown v. Board of Education*, which held that school systems were not responsible for desegregation across district lines unless it could be shown that they deliberately had engaged in a policy of segregation.

In *Milliken*, the federal court held that it could not provide a solution for "single-district school segregation violations where there is no finding that the other committed acts that affected segregation within the other districts" (Justia, n.d.). Because of *Milliken,* the Detroit school board would not have full control of its schools, as the district remained under a federal judge's supervision from the late '70s until 1989, when the district provided a resolution to make educational improvements in deficient and segregated schools (Lindseth, 2004; *Milliken v. Bradley*, n.d.). *Milliken* shielded suburban schools from racial integration and reinforced local autonomy

as a better practice for supporting public schools and a quality educational process (McNeal, 2011; *Milliken v. Bradley*, n.d.).

In 1978, Michigan added an amendment to the state constitution called the Headlee Amendment, which impacted school funding. This amendment requires that mandates receive voter approval if seeking additional school funding, limits certain taxes, applies limits to school revenue collected, and prohibits the state from reducing state funding proportions on any school activities that the state mandates (Cleary & Summer-Coty, 1999). This amendment sparked *Durant v. State* (563 N.W.2d 646, 1997) where Donald Durant sued the state, alleging a violation of the Headlee Amendment. Specifically, he accused the state of failing to provide sufficient program funding for education. The courts asked the plaintiffs to focus on more specific programs or services, such as special education, transportation, and lunch programs (Cleary & Summer-Coty, 1999). The suit was filed on behalf of seven taxpayer residents and the Fitzgerald School District board.

In 1997, the Michigan Supreme Court issued a verdict on the case that affected 83 plaintiff school districts (Cleary & Summer-Coty, 1999), ruling that Michigan had been funding these programs at proportionally lower levels than what was appropriated in 1978 (Cleary & Summer-Coty, 1999). The court determined that special education and special-education transportation or busing are required by state law within the Constitution (Article 9, Section 29). Therefore, the state was required to maintain financing of necessary special-education costs, including transportation (*Durant v. State*, 1997; Cleary & Summer-Coty, 1999). *Durant* impacted school finances, including settlements paid over 15 years, with funding-percentage requirements currently still maintained by the state (Cleary & Summer-Coty, 1999). *Milliken* and *Durant* are prominent cases in the development of Michigan school aid.

State of Michigan legislation. In July 1993, Michigan's legislature eliminated local school property taxes due to public outcry about increasing rates, which resulted in a reduction of nearly $7 billion in funding for Michigan's public schools beginning in the 1994-95 school year. However, the change created an opportunity to revise school-aid funding (Senate Fiscal Agency, 1995). Subsequent to the elimination of local school property taxes and school-funding challenges, the State of Michigan again sought policy options to equalize funding by passing Proposal A on March 15, 1994 (Michigan House of Representatives, 1996; Michigan Department of Treasury, 2002; Joy & Arellano, 2016).

Before Proposal A, Michigan relied on a power-equalization model that allowed districts to set a guaranteed tax base per pupil and to choose local tax rates. The result was further inequities in school funding and pressure on residents to pay the property tax (Michigan Department of Treasury, 2002). Michigan decided to convert Proposal A into a redistributive policy. Redistributive policies fall into two broad categories: (a) policies that shift power from one group to another; and (b) policies that shift economic resources from one group to another (e.g., voucher programs). *Redistributive policies* are intended to reduce inequities by altering the traditional education landscape (Seshadri & Yuki, 2004; Murray, 2011; Fowler, 2013). Proposal A was a further attempt to equalize resources and balance student populations across district lines and school systems to eliminate inequities (Michigan Department of Treasury, 2002; Loeb & Cullen, 2004).

***Proposal A*.** Proposal A is viewed as a redistributive policy, as it aims to equalize or redistribute funding for schools to improve equity (Michigan Department of Treasury, 2002). Under the policy, the per-pupil modified foundation allowance, or a funding stream that supplies most funding resources to districts, could follow a student to his or her school of choice

(Michigan Department of Treasury, 2002). The modified foundation allowance created three principal foundation allowances that include minimum, basic, and state maximum guaranteed foundation allowances to improve equity and lower property taxes for Michigan residents. The minimum foundation allowance regulates the minimum level of funding that no district can fall below, and the basic foundation allowance is calculated by making incremental dollar increases to the initial amount, with the state maximum being the amount that the state caps toward a district's per-pupil revenue when using the foundation formula (House Fiscal Agency, August 2016).

Because student performance was linked to school funding, Proposal A was created as a modified foundation system of taxation that raised revenues for schools by changing the types of taxes selected, incidence of taxation, and local share of taxes (Loeb & Cullen, 2004). The revenue sources include sales tax, use tax, income tax, real estate transfer tax, cigarette tax, other tobacco products tax, liquor excise tax, lottery, state property tax, and local non-homestead property tax (Office of Revenue and Tax Analysis Michigan Department of Treasury, 2002). In changing the source of school funding from local property taxes to state taxes, finance became highly centralized at the state level (Michigan Department of Treasury, 2002). However, it is important to note that a state's economic conditions can impact school funding positively or negatively under a foundational allowance, i.e., school funding may increase or decrease.

Funding model and charter public schools in Michigan. In addition to restructuring the funding model, Proposal A introduced school choice, specifically charter public schools, into Michigan on March 15, 1994 (Office of Revenue and Tax Analysis Michigan Department of Treasury, 2002). Charter public schools intended to bring high-quality options to low-income and minority families, revitalize the traditional public school system, use flexible resource-

allocation practices to yield results for students, and produce cost savings to public school districts (Henig, Moser, Holyoke, & Lacireno-Paquet, 1999; Mendez, 2004). *Resource allocation* is how fiscal and non-fiscal resources are divided among competing needs (instruction, operation, and facilities management) and expended for educational purposes (Pan, Rudo, Schneider, & Smith-Hansen, 2003). The National Alliance for Charter Schools indicates that charter public schools are more flexible and innovative than traditional public schools and can improve areas like Detroit (National Alliance for Public Charter Schools, 2011).

Michigan Compiled Law (MCL) 380.501, part 6A, established the definition of a *public school academy* (PSA) and outlined the purpose and unique statutory features for operation. In the statute, a PSA is a charter public school that operates under a charter contract that a public authorizing body issues. Authorizing bodies include state public universities, community colleges, K–12 local education agencies (traditional school districts), and Intermediate School Districts (ISDs) or Regional Education Service Agencies (RESAs). The authorizing body may receive a 3 percent administrative fee, based on total school aid, to oversee a charter public school. Michigan charter public schools receive funding through a per-pupil-based foundation allowance, similar to traditional public schools, according to the State School Aid Act or MCL 388.1606(6)(1).

Michigan legislation sets the flexibility range for charter public schools and provides autonomy. Consistent with section 4310 of the ESEA (Part 6A), the Michigan Revised School Code (MCL 380.501-MCL 380.507 *et seq*.) provides for a high degree of legal autonomy for charter public schools. When a charter (agreement) contract is issued, whether it is for a new school or reauthorization of an existing school, Michigan statute MCL 380.502(4) requires:

> An authorizing body shall oversee, or shall contract with an ISD, community college, or state public university to oversee, each public school academy (PSA) operating under a contract issued by the authorizing body. The authorizing body is responsible for overseeing compliance by the board of directors with the contract and all applicable law (Michigan Legislature, 1993, p. 2).

Michigan statute MCL 380.507 gives a charter public school developer a great degree of flexibility in choosing an authorizer. Ten current authorizing bodies have statewide authority in Michigan. Authorizer responsibilities are mandated in the RSC §380.507 and may include oversight, acting as a fiscal agent for the charter public school and ensuring that all laws are followed. The school-aid payment for the charter public school is paid to the authorizing body, which forwards the payment to the charter public school (Michigan Department of Education, 2017).

Authorizers can issue charters in any geographic location, and this flexibility has been important for charter public schools wishing to expand or move across county lines in ways typically restricted by geographically defined catchment areas for traditional public schools. The statute leaves charter public school enrollment and operational decisions in the hands of charter authorizers, management organizations, and boards of education (Arsen & Ni, 2012). Again, the purpose is to provide charter public schools with more flexibility and autonomy to operate.

Since passage of MCL 380.50, part 6A, in 1994, 297 state charter districts have been created, with a total of 373 school sites within these districts (MI School Data, 2018). A single, stand-alone building is considered a charter district and a school building, hence, the 297 charter districts. In many cases, a stand-alone building may expand to offer other grade levels or configurations, hence, the 373 school sites. In Michigan, some charter districts may include one

or more schools with various charter public school configurations (i.e., K–5, 6–8, and 9–12). Of the 373 charter public schools, 126 serve grade-level students in K–8 settings, 156 operate in various K-12 configurations (K-2, Pre-K-2, K-4, etc.), 82 serve grade-level students in a grade 9–12 setting, two operate in a general education K–12 setting, five operate in an alternative-education or credit-recovery setting, and two operate in a special-education setting (MI School Data, 2018). Many of the charter public schools operate in Detroit to provide a high-quality or HCC option in a city with several challenges.

City of Detroit. The HCC model's purpose is to provide high-quality education to disadvantaged students despite funding and demographic concerns. Michigan's largest city is Detroit (Gawlik, Kearney, Addonizio, & LaPlante-Sosnowsky, 2012), and it needs high-quality solutions because of demographic concerns. Since 1999, nearly 100 public schools have closed in Detroit, with reasons including drops in enrollment, debt, and the condition of schools (Cave, 2010). School buildings are plagued by leaky roofs, faulty plumbing, outdated resources, and poor heating and cooling systems due to negligence and insufficient maintenance (Joy & Arellano, 2016). With issues such as population decline, poverty, lack of job opportunities, and strained fiscal resources, these challenges will only continue to hamper Detroit students' education quality (Loeb & Cullen, 2004; Cave, 2010; Augenblick, Palaich, & Associates Inc., 2016; CATO Institute, 2018).

Population. In the past two decades, Detroit's population dropped by 237,493 due to job losses and other effects from the national recession (Michigan Department of Technology, Management, and Budget, 2015). In the past five years, the city's population has decreased from 688,740 to 672,795 (Michigan Department of Technology, Management, and Budget, 2015; U.S. Census Bureau, 2017). Detroit's population is younger than Michigan's overall population, with

the median age for men at 33 and for women, 38, with a large group of 20- to 24-year-olds comprised of both genders (Data Driven Detroit, 2012). Table 2.1 shows that African Americans (80 percent) comprise a majority of the population in Detroit, with a 25 percent overall population decrease between 2000 and 2010 (Data Driven Detroit, 2012). Table 2.1 also provides context for overall subgroup changes over this decade within Detroit's city limits.

Table 2.1

Population Change in the City of Detroit by Subgroup

Subgroup	2000	2010	Percent Difference
Total population	951,270	713,777	25%
Hispanic or Latino	47,167	48,679	-3%
Population of one race	885,439	652,616	26%
White alone	99,921	55,604	44%
Black or African American alone	771,966	586,573	24%
American Indian and Alaska Native alone	2,572	1,927	25%
Asian alone	9,135	7,436	19%
Native Hawaiian and other Pacific Islander	169	82	51%
Other race alone	1,676	994	41%
Two or more races	18,664	12,482	33%

Note: Adapted from data retrieved at Data Driven Detroit, https://datadrivendetroit.org/toolbox/

As context for how population decline impacts school enrollment, in 1998, the previously named Detroit Public Schools reported that enrollment totaled over 175,653 students, but by the 2009–2010 school year, enrollment dropped to 85,690 students (Gawlik, Kearney, Addonizio, & LaPlante-Sosnowsky, 2012). In the past five years, enrollment in the Detroit Public School Community District (DPSCD), formerly Detroit Public Schools, totaled 45,720 (MI School Data, 2018). DPSCD was created through the Michigan Legislature's passage of education-reform laws in the past few years. DPSCD replaced Detroit Public Schools to help alleviate past district debt in the name of Detroit Public Schools. With the name change, DPSCD is faced with funding issues due to fluctuating enrollment, which likely will continue to affect schools that already are

challenged negatively (Michigan Department of Treasury, 2002; Chang, May, Maloney, Batdorff, Wolf, & Speakman, 2014; Kids Count in Michigan Data Book, 2018).

Poverty. The poverty rate has dropped to 42 percent, but is still relatively high for Detroit children, compared with the state average of 20 percent (Kids Count in Michigan Data Book, 2018). Two indicators of a population's well-being are poverty and income. If income is low, poverty is high. Poverty has been linked to poor emotional and physical health, low educational achievement, and few prospects for future employment (U.S Department of Education, 2017).

The Metro Detroit counties of Wayne, Oakland, and Macomb experienced eight percent growth in poverty in the past decade (Michigan Department of Technology, Management, and Budget, 2015). Detroit is 24 percent higher than the state average for people living in poverty (Michigan Department of Technology, Management, and Budget, 2015; Kids Count in Michigan, 2016; U.S. Census Bureau, 2017). According to the U.S. Department of Education (2017), over 50 percent (6 in 10) children under the age of 18 in Detroit are living in poverty, and African American students tend to suffer most from the financial, educational, and social disparities that poverty elicits (Data Driven Detroit, 2011; U.S. Census Bureau, 2017; U.S. Department of Education, 2017; Kids Count in Michigan Data Book, 2018). The federal government uses the number of students on food assistance to determine the number of students in poverty (U.S. Department of Education, 2017). Table 2.2 provides a disaggregation of children in poverty in Detroit, providing overall poverty rates for children ages 0-17 and young children ages 0-5, and the rate of students receiving free and reduced-price lunches. The data demonstrate a decrease in overall population, along with a steady increase in children living in poverty and receiving school-lunch assistance.

Table 2.2

Number of Detroit Children in Poverty Receiving Federal Food Support

	2010		2016		
Subgroups	Number	Rate	Number	Rate	MI Rate
Children in poverty, ages 0–17	99,843	54%	85,762	51%	21%
Young children, ages 0–5, in the Food Assistance Program	43,878	63%	32,266	62%	28%
Students receiving free/reduced-price school lunches	97,424	81%	69,281	82%	46%

Note: Adapted from data retrieved at Data Driven Detroit, https://datadrivendetroit.org/toolbox/

Education attainment. Poverty is associated with lack of post-secondary education or dropout rates (Michigan Department of Technology, Management, and Budget, 2015). Among those age 25 and up in Detroit, 23 percent had less than a high school diploma, with over 50 percent not holding a high school diploma, 32 percent having some college with no degree or an associate's degree, and 13 percent holding a bachelor's degree or higher (Michigan Department of Technology, Management, and Budget, 2015). More recently, 21 percent had less than a high school diploma, and 13.8 percent had a bachelor's degree or higher (U.S. Census Bureau, 2016).

Income. The median income for the city's African Americans is $18,000, and the median housing value is $36,800 (U.S. Census Bureau, 2016). For Detroit children, 10 percent of children under age 18 had parents or guardians who did not complete high school, 35 percent lived with only one parent (mother 27 percent; father 8 percent), and 20 percent lived in poverty (Condition of Education Report, 2017; U.S. Department of Education, 2017). Income disparities exert a negative impact on children's socio-emotional health and education (U.S. Department of Education, 2010). Detroit needs programs and services to incorporate high-quality education options for African American students.

Funding. When the Great Recession began in 2007, some states cut their educational funding, and it took many years to restore their funding to pre-recession levels (Center on Budget and Policy Priorities, 2017). Comprehensive spending data show that 29 states were providing less school funding per student between 2008 and 2015, with some states, including Michigan, cutting formula funds, which is the primary state support for schools, by seven percent (Center on Budget and Policy Priorities, 2017).

State cuts forced local school districts to scale back education services or seek millages to cover expenses (Jackson, Johnson, & Persico, 2015). The Headlee Amendment requires that mandates receive voter approval if seeking additional school funding or millages (Cleary & Summer-Coty, 1999). *Millages* (*mills*) are a rate of property taxation, or 1/1000th of a dollar; therefore, if the rate is five (5) mills, this simply means a tax of .005 cents on every dollar (Michigan Department of Treasury, 2002; City of Wixom, n.d.). The previously discussed Proposal A and the Headlee Amendment capped tax increases to the lesser of inflation, or five percent to manage property tax increases (City of Wixom, n.d.). Low-income areas are challenged with replacing those dollars, as millages are often not an option. Also, Michigan has cut taxes that reduced school funding and allocated income to tax relief, rather than education programs (Richards, 2017).

While both charter and traditional public schools have access to per-pupil funding, charter public schools do not have full access to tax millages (property tax) or capital gains (profits from the sale of an asset) (Michigan Department of Treasury, 2002). The former MCL 380.503 (9) prohibited charter schools from levying millages; however, the current MCL 380.1211 has allowed for access to some funding in the form of ISD millages. Before 2017, charter public schools did not have access to local revenue and no required contributions. As of

October 18, 2017, the Senate passed a bill that supports revenue extracted through regional enhancement property taxes that intermediate school districts (ISD) or regional educational service agencies (RESA) levy and that traditional public schools distribute, to be shared among charter public schools within the ISD or RESA geographic area (Michigan Votes, 2017). Charter public schools now have access to ISD tax millages.

Charter public schools still do not have access to local millages based on their location; therefore, charter public schools are at a disadvantage. Bynoe and Feil (2016) found that the middle (68 percent) distribution of charter public schools in Michigan shows trends of disparate inter-school per-pupil spending between 1997 and 2014. Along with differences in funding, differences in school facilities exist. Charter public schools in Michigan spend more operating funds on facilities, whereas traditional public schools spend less (National Charter School Resource Center, 2013; Bynoe and Feil, 2016). With limited access to all possible school resources, the statute places charter public schools at a greater resource disadvantage than traditional public schools (Augenblick, Palaich, & Associates Inc., 2016). Given the per-pupil funding formula in Michigan (Proposal A), some Michigan public schools in economically depressed areas may receive less funding because of location.

While Proposal A was designed to equalize school funding, it does nothing to equalize capital or make assets uniform, such as millages (Loeb & Cullen, 2004). The reality is that enrollment impacts funding, which, in turn, impacts teacher and staff recruitment, and the ability to maintain operations (Loeb & Cullen, 2004; Waslander, Pater, & Van der Weide, 2010; Augenblick, Palaich, & Associates Inc., 2016). With so many challenges, the question is whether the introduction of marketplace competition has exerted a positive impact.

Marketplace Competition Outcomes

Studies conducted to determine marketplace competition's effects on student performance show that context is a major factor in charter and traditional public schools' performance comparisons, as the results either were not statistically significant or called for more variables to be incorporated using multiple-regression approaches (Bifulco & Ladd, 2006; Konstantopoulos, 2005; Center for Research on Education Outcomes, 2009; Zimmer, Gill, Booker, Lavertu, & Witte, 2012). A regression model assesses the relationship between continuous independent variables to predict the value of a dependent variable. It will accomplish the following: (a) determine whether the regression between variables is statistically significant; (b) determine how much of the variation in the dependent variable is explained by the independent variable; (c) explain the direction and magnitude of any relationship; and (d) predict the dependent variables' values based on the independent variable's different values (Laerd Statistics, 2015). That is, regressions express findings by explaining how much an independent variable contributes to a dependent variable (Salkind, 2017).

The range of findings based on multiple regressions indicates that charter public schools exerted no significant impacts on traditional public school students' achievement levels, yielding mixed results concerning traditional public schools vs. charter public schools on performance, mostly based on context and research characteristics (Bifulco & Ladd, 2006; Konstantopoulos, 2005; Center for Research on Education Outcomes, 2009; Zimmer, Gill, Booker, Lavertu, & Witte, 2012). The studies' outcome commonality requires examining more variables that impact each school to obtain a complete picture of the comparison between charter and traditional public schools.

In terms of resource allocation, these results were mixed as well. A strong relationship exists between funding and student performance (Pan, Rudo, Schneider, & Smith-Hansen, 2003). One of the defining components of a charter public school that makes it competitive is its perceived ability to operate with fewer resources to obtain better results (CATO, 2018). The studies found that charter public schools can produce educational outcomes at a lower cost than traditional public schools, but the studies also clearly showed that results vary depending on context, such as funding challenges and the population served (Booker, Gilpatric, Gronberg, & Jansen, 2008; CATO, 2018). An explanation for the difference is that charter public schools serve smaller numbers of students, whereas traditional public schools serve a wider group of students in terms of ages/grades, those in special or early-childhood education, and non-native English-language students, boosting education costs (Gronberg, Jansen, & Taylor, 2012).

Student performance. Konstantopoulos (2005) aimed to determine the impact of using multiple school variables on student performance in math, reading, and science. The variables included student- and school-level factors. At the student level, the variables included gender, race/ethnicity, and a composite measure of students' socioeconomic status (SES). The SES composite comprised parental educational level, occupation, and income. The school-level variables included indices of school structure, such as school location and school urbanization (urban, suburban, rural). Other indices for school composition included school attendance, dropout rates, college attendance rates, length of school year (in weeks), indices of school resources, and school organization/curriculum (Konstantopoulos, 2005).

The dependent or outcome variables used in the study were math, reading, and science test scores. The study involved a series of within-school and school-level regressions using the aforementioned variables to understand variation. Data from three major surveys over multiple

years containing nationally representative samples of high school students were used as well. The findings highlighted the importance of examining specific school (location, demographics, etc.) and teacher (pay, education, time, etc.) effects and indicated that additional school factors could be added in future studies to determine predictors of student performance in math, reading, and science. The study found that using multiple variables could determine which ones exert the greatest impact on school performance. The results suggest that future research should examine how allocation of school resources affects students across multiple grade ranges (Konstantopoulos, 2005).

Bifulco and Ladd (2006) used a multiple regression to evaluate the impact of charter public schools in North Carolina using math and reading outcomes of students in grades 4–8 by employing an approach similar to that of Konstantopoulos (2005). The variables were fixed (non-random) and addressed quality differences between charter and traditional public schools. These multiple variables included reading and math tests, a specific school, school type, grade level, gender, ethnicity, and the highest level of education that students' parents completed. The study also examined whether students who attend traditional public schools register larger gains if located near a charter public school. The researchers discovered that because of the location of many charter public schools in relation to traditional public schools, the amount of competition is minimal, meaning the charter public schools were not located in traditional public schools' geographic areas, with few charter public schools nearby to compare impacts.

Regarding achievement, no significant difference existed between charter public school students and traditional public school students' achievement levels. Charter public schools actually registered smaller gains in student performance than traditional public schools. The study suggests that other factors affect gains in the school environment, including charter public

schools' overall resources, e.g., fewer educational services provided to a smaller number of disadvantaged students.

Zimmer, Gill, Booker, Lavertu, & Witte (2012) replicated the Center for Research on Education Outcomes (CREDO) (2009) study, in which CREDO matched multiple students using longitudinal data and found that charter schools performed better. Zimmer et al. (2012) believed that the CREDO (2009) study minimized selection bias only to the degree of observable characteristics used for matching controls in sorting students across charter and traditional public schools. Therefore, in comparing two states and five cities, Zimmer et al. (2012) examined state policies and developed a regression model in which the group means are not randomized, but fixed. Data were grouped according to several observable factors (Laerd Statistics, 2015). The student-level data comprised school identifiers, students' grade level and race/ethnicity, and students' test scores in math and reading. Statewide longitudinal student-level data were collected from Ohio and Texas, and district-wide data were collected from five large, urban school districts to track individual students' academic performance from the remaining cities (Chicago, Denver, Milwaukee, Philadelphia, and San Diego). The test scores were scaled from state accountability tests or district-administered tests. The researchers used grade levels, subjects, and geographic locations, standardizing them by district-wide or statewide distribution in each grade and subject.

Zimmer et al. (2012) studied two states and five cities (Ohio and Texas; Chicago, Denver, Milwaukee, Philadelphia, and San Diego) and found that performance at charter public schools in these locations yielded mixed results, specifically in charter public schools vs. traditional public schools' performance levels. Data from Texas and Ohio showed that students performed similarly. Some evidence in Chicago and Texas indicated that traditional public

schools performed marginally better, and Denver showed that charter public schools performed marginally better. Overall, the results showed that students performed similarly across the two settings (charter and traditional) in most locations. The study indicated that researchers must be more explicit when designing studies to compare charter and traditional public schools to ensure better understanding and representation. The study illustrated a need to understand the baseline similarities between school characteristics and student demographics before comparing charter and traditional public schools.

Resource allocation. To examine education efficiency, students' performance scores for reading and math and resource allocation were compared commonly (Waslander, Pater, & Weide, 2010; Preston, Goldring, Berends, & Cannata, 2012; Harris, 2017).First, it is important to understand the relationship between resource allocation and student performance. The U.S. Department of Education's Southwest Educational Development Laboratory (SEDL) (2003) was contracted to conduct a research study that examined the relationship between resource allocation and student performance amid education reform (Pan, Rudo, Schneider, & Smith-Hansen, 2003). The researchers analyzed data on student performance and fiscal (resource) allocation from independent school districts in five states, including Arkansas, Louisiana, New Mexico, Oklahoma, and Texas, where school funding and effective distribution have been linked to student performance. The study used cost-efficiency methods that economists and education researchers developed to explain and measure ROI and the link between resources and student performance. The study examined an effort's specific functions and its production functions or limits. Production functions are calculated explanations of how independent variables or efforts contribute to outcomes (Pan, Rudo, Schneider, & Smith-Hansen, 2003). The study found a strong relationship between resources and student success. Specifically, SEDL indicated that resource

level affects overall school operations, and that resource-allocation practices impact student outcomes (Pan, Rudo, Schneider, & Smith-Hansen, 2003).

Booker, Gilpatric, Gronberg, and Jansen (2008) examined whether charter public schools elicit lower costs and better educational outcomes than traditional public schools. The researchers found that charter public schools can produce educational outcomes at a lower cost than traditional public schools. To examine cost efficiency, the study used the stochastic (random) cost-frontier model, which uses panel data in which education cost is a function of education outcomes' quantity and quality of (Booker et al., 2008). The random cost-frontier model was developed in 1977 as an economic model that uses estimates to measure efficiency. The study uses district cost as a function of the outcomes that the school generates, the efforts' cost, and the demographics of students and parents who impact the organization directly (Booker et al., 2008). The approach also examined the relationship between the cost of education services and environmental cost factors (independent variables), controlling for the level of school productivity (fiscal resources) (Anderson & Kabir, 2000; Gronberg, Jansen, Taylor, & Booker, 2005).

Gronberg, Jansen, and Taylor (2012) used a cost-efficiency model that compared charter public schools with traditional public schools and explored the extent to which differences are attributed to hiring and compensation practices. The study built on research by Booker, Gilpatric, Gronberg, and Jansen (2008). The differences were based on education service components that examined funding and operations (Booker et al., 2008). The researchers used a linear-regression model to predict the value of a dependent variable (funding) based on the value of multiple independent variables (Gronberg, Jansen, & Taylor, 2012).

Gronberg et al. (2012) found that by examining multiple variables, charter public schools

can produce educational outcomes at a lower cost. However, charter public schools are not more efficient systematically than traditional public schools. With smaller numbers of students than traditional public schools, charter public schools have access to lower-cost resources, whereas traditional public schools serve a wider group of students, such as those requiring special education, which boosts education costs. The study was conducted in Texas, where it is more difficult to open new charter public schools due to state laws that limit the number of charter public schools that can exist at any one time; thus, competition between charter and traditional public schools is limited (Gronberg et al., 2012). In support of Gronberg et al. (2012), Toma and Zimmer (2012) replicated the Gronberg et al. study to answer the question of charter public schools' cost-effectiveness. The authors illustrated that charter public schools provide schooling at lower per-unit costs than traditional public schools, but charter public schools perform similarly to traditional public schools when comparing student performance.

Augenblick, Palaich, and Associates Inc. (2016) conducted a regression analysis for the Michigan Department of Treasury to examine school districts' revenue and expenditures, and the Michigan Student Test of Education Process (M-STEP) outcomes. The analysis examined the relationship between school finance, and school and student predictive variables. The study used percentages of economically disadvantaged, special-education, Hispanic, and African American students; operational spending per student; and percentage of non-native English-language learners in examining reading and math proficiency. The study showed that operational spending per student was related significantly to both math and reading proficiency, or "an increase of $1,000 in spending per student was associated with a 1 percent increase in proficiency for both math and reading" (Augenblick, Palaich, & Associates Inc., 2016, p. 4). However, Augenblick, Palaich, and Associates Inc. (2016) compared successful district practices to unsuccessful

practices vs. comparing similar districts to determine resource allocation and production. While the study methodology did not compare districts based on similarities, the methodology for examining allocation and spending practices to determine cost effectiveness provides insight into examining return on investment.

Cost effectiveness. Nonprofit organizations first developed cost effectiveness in 1969 for use in education to improve decision making. State education agencies adopted the process to help stabilize their budgets and demonstrate effective resource-allocation practices (Jablonsky, 1977). Cost effectiveness represents the lowest amount of costs (efforts) to produce or meet desired outcomes (productions). Since then, research has used the cost-effectiveness approach to examine charter and traditional public schools' finances (Gronberg, Jansen, Taylor, & Booker, 2005; Booker, Gilpatric, Gronberg, & Jansen, 2008; Gronberg, Jansen, & Taylor, 2012).

Extant studies offer greater context on how to develop cost-effectiveness models that measure resource-allocation practices to examine current practices in schools (Gronberg, Jansen, Taylor, & Booker, 2005; Booker, Gilpatric, Gronberg, & Jansen, 2008; Gronberg, Jansen, & Taylor, 2012; Toma and Zimmer, 2012; Augenblick, Palaich, & Associates Inc., 2016). Charter public schools can operate with greater flexibility and autonomy than traditional public schools, including resource-allocation practices (Michigan Legislature, 1993). With cities in Michigan currently under financial stress, Proposal A was passed to adopt different resource-allocation practices that demonstrated cost effectiveness (Jablonsky, 1977; Loeb & Cullen, 2004; Arsen & Ni, 2012). The question is whether adoption of marketplace competition achieved the desired outcomes of improved student performance and resource allocation.

Marketplace Competition Outcomes in Michigan. Charter public schools in Michigan have increased marketplace competition in Detroit (Waslander, Pater, & Van der Weide, 2010).

Marketplace/free-market competition is an economic system based on supply and demand to satisfy a large number of consumers' (including parents and students) wants and needs (Preston, Goldring, Berends, & Cannata, 2012; Harris, 2017). Competition between charter and traditional public schools is thought to encourage traditional public schools to perform better (Arsen & Ni, 2012, p. 2).

As evidenced in student outcomes, Detroit does not utilize effectively the HCC model that supports the desired qualities of character, citizenship, partnerships with families and communities, rigorous curricula, and strong teachers due to the area's capacity (Bettinger, 2005; National Center for Education Statistics, 2013; Brighouse & Schouten, 2014). Lake, Jochim, and DeArmond (2015) found that the challenge of navigating school choice in Detroit is now more complicated for parents, as charter public schools are competing with each other for students, as well as with traditional public schools (Senate Fiscal Agency, 2012; Lake, Jochim, & DeArmond, 2015; Michigan Department of Education, 2017).

Beyond the challenges of navigating school choice is the impact of marketplace competition on student performance. The Proposal A policy created marketplace competition to improve student performance (Michigan Department of Treasury, 2002). Since the passage of Proposal A, important studies relative to Michigan have been designed to examine student performance, comparing the policy's impact on areas similar to Detroit (Center for Research on Education Outcomes, 2013; Bettinger, 2005).

Bettinger (2005) conducted a foundational study that compared charter and traditional schools in Michigan, examining charter and traditional public schools using multiple variables to determine the variables' overall impact on student performance. The study used a multiple-regression model to study Michigan charter and traditional public schools' effects, including

charter public schools' impact on neighboring traditional public schools. Using school- and student-level data from Michigan, Bettinger (2005) found that charter and traditional public schools were not much different from each other. The goal was to gauge each model's effectiveness in offering education services (excluding financial data). However, the Center for Research on Education Outcomes (CREDO) study in 2013, which MDE and organizations utilize in support of charter public schools regardless of the study's weaknesses or lack of peer review, overshadowed Bettinger's study.

A more referenced national study that Michigan and stakeholders used to support charter public schools, CREDO (2013) compared charter and traditional public schools' performance using student performance vs. multiple impact variables on student performance and the level of resources that may affect educational outcomes (Bettinger, 2005). Impact variables refer to those that affect student performance negatively or positively. CREDO (2013) used the Virtual Control Record (VCR) methodology. VCR matches student records followed over time with match factors that include grade level, gender, race/ethnicity, free or reduced-price lunch status, non-native English-language learner status, special-education status, and prior test scores on state achievement tests. The study first conducted a comparison on an aggregate statewide level. Next, the factors were disaggregated at the school level to determine whether observed charter school performance was consistent when compared with traditional schools. The student characteristics included standardized starting score, race/ethnicity, special education and lunch-program participation, English proficiency, grade level, and whether the student repeated a grade. CREDO (2013) concluded that Michigan's charter public school students learn more in a year than traditional public school students in reading and math, and that this gain is more pronounced

in Detroit. Based on this study, charter public schools perform better than traditional public schools.

The University of Michigan's Gerald R. Ford School of Public Policy Report (2016) examined the practices and policies in charter and traditional public schools. The data collected included a total of 435 schools, including 226 charter public schools and 209 traditional public schools. The study found that charter and traditional public schools are, indeed, different legislatively in Michigan, but not operationally. The study suggests that education innovation, defined as the introduction of new or different ideas in educating students that often comes with charter public schools, resembles that of traditional public schools (University of Michigan, 2016; U.S. Department of Education, 2005).

With the *Brown v. Board of Education* decision, Michigan began to experience further segregation and racial isolation through white flight to the suburbs, which has increased educational inequities (Roth, 1971; Landauer-Menchik, 2006; Ross, 2010; Chambers & MacDonald, 2017; Kye, 2018). With the addition of marketplace competition, charter public schools in Michigan arguably are more segregated than traditional public schools (National Center for Education Statistics, 2015; U.S. Department of Education, 2017). African American students attending traditional public schools comprise 64 percent of the student body, whereas 90 percent of students in charter public schools are African American (Loeb & Cullen, 2004; Caldwell, 2016; National Center for Education Statistics, 2015).

Student Performance in Detroit

Data. Some organizations systematically report state and local school district data. The National Assessment of Educational Progress (NAEP) assessed students' performance in Detroit as a gauge of competition outcomes. NAEP is a national assessment of U.S. students to

determine the extent of content knowledge in various subject areas, at various grade levels (U.S. Department of Education, n.d.). The states that receive Title I funds must submit a state plan to the U.S. Department of Education indicating participation in the biannual NAEP assessment of reading and math at grades four and eight, while content areas besides reading and math are optional (U.S. Department of Education, n.d.). States that do not receive federal Title I funds are not required to participate in the NAEP assessment program.

The National Center for Education Statistics (NCES) is a federal organization within the U.S. Department of Education that collects and analyzes data related to education. NCES is the primary agency that collects and analyzes data related to education in the U.S. and compares the data with that of other nations. Congress has mandated that NCES report statistics on the condition of education in the U.S. and review and report on education activities internationally. NAEP operates under the National Assessment Branch of the NCES, which uses the NAEP to gauge student performance and publish reports on student performance nationwide every two years.

Education Trust-Midwest (Ed-Trust) is a non-partisan group that works with policymakers, educators, advocates, parents, and community groups to advance and develop policies and conduct statewide research. Ed-Trust seeks to reduce gaps in achievement for all children, with a specific emphasis on African Americans, Latinos, Native Americans, and those from low-income families. Ed-Trust conducts research using resources such as NAEP and NCES, state data, and local data to identify trends and best practices, sharing knowledge to better understand gaps. Ed-Trust also seeks to provide solutions based on the data collected and analyzed.

Results. Based on NAEP data, Detroit students' achievement rates have not improved in the past two decades (U.S. Department of Education, n.d.; National Center for Education Statistics, 2013). African American students in Michigan consistently have performed poorly in each content area (National Center for Education Statistics, 2013; Higgins, 2015; Lewis, 2015). Children living in poverty tend not to perform well on the NAEP reading, math, music, and art assessments, as evidenced by the NAEP results for Detroit over the past five years (U.S. Department of Education, 2010). In the past few years, the results showed that only 10 percent of African American students were proficient or above proficient in fourth-grade math, nine percent in fourth-grade reading, five percent in eighth-grade math, and nine percent in eighth-grade reading (Higgins, 2015; U.S. Department of Education, n.d.). Detroit students scored the lowest in the nation for five straight years in reading and math, with only 29 percent of students registering basic proficiency (National Center for Education Statistics, 2013; Lewis, 2015; Nation's Report Card, 2015).

The NCES (2015) reported that African American students are underperforming in college readiness, math, science, and language-arts proficiency, and the Ed-Trust (2015) study supported the report by highlighting that Michigan students ranked in last place in fourth-grade reading, while Detroit continues to fall behind the rest of the country in fourth- through eighth-grade reading and math (NCES, 2015; Lewis, 2015; Ed-Trust, 2015). More specifically, 4 percent of Detroit students scored at or above proficient in fourth-grade math (36 percent statewide), and the average dropped five percentage points; 5 percent of Detroit students scored at or above proficiency in fourth-grade reading (32 percent statewide); 5 percent of Detroit students scored at or above proficiency in eighth-grade math (31 percent statewide); and 7

percent of Detroit students scored at or above proficiency in eighth-grade reading (34 percent statewide) (NCES, 2015; Higgins, 2018; Einhorn, 2018).

The Bettinger (2005), Center for Research on Education Outcomes (2013), and University of Michigan's (2016) studies compared Michigan charter and traditional public schools from federal, state, and local perspectives using school-level and student-level data comprised of variables such as numbers of students who were disabled, homeless, non-native English-language learners, economically disadvantaged, or chronically absent, along with their attrition rates, grade level, race, and gender, and the school's graduation rates, location, years in operation, and overall student performance (growth and proficiency). In addition to the available variables for Michigan, this study is examining the ROI of charter and traditional public schools to determine the efficacy of fiscal resource-allocation practices and those practices' outcomes on student performance in Detroit (Pan, Rudo, Schneider, & Smith-Hansen, 2003; Gronberg, Jansen, Taylor, & Booker, 2005; Murray, 2011; Gronberg, Jansen, & Taylor, 2012).

Summary

The literature review provides information on African Americans seeking equity in education, the federal government's equalization efforts, the charter public school context, the outcome of marketplace competition, and studies examining student performance in Detroit. For the present study, the focus revolves around resource-allocation practices and which public-school model performs better using financial and student-performance data from the M-STEP as the outcome or measurement. The literature review encompasses studies that offer a range of analyses considering the various conditions in Detroit that may influence student performance. This study uses descriptive statistical analysis, t-tests of the means, and multiple-regression

modeling to determine the significance of any differences in charter and traditional public schools' ROI by examining resource allocation and student performance.

Chapter 3: Methodology

The purpose of this research is further exploration of charter and traditional public schools regarding their differences in fiscal spending to determine which of the two models produces a better ROI (Pan, Rudo, Schneider, & Smith-Hansen, 2003; Gronberg, Jansen, & Taylor, 2012). With the introduction of marketplace competition, this study compares charter and traditional public schools to determine whether differences exist in their use of resources, and secondarily, whether spending practices translate to better student performance. The study uses two public school types in the urban context studied by examining whether a difference exists in fiscal spending to determine which of the two is producing better student-performance outcomes, as well as examine district-level resource-allocation patterns and student performance utilizing a profile of schools' characteristics that may impact educational service performance. The profile's purpose is to ensure that all characteristics are closely aligned for a consistent comparison.

This study excludes various grade-level configurations because the Michigan Student Test of Educational Progress (M-STEP) tests only grades 3–8 (i.e., K–5, K–6, etc.). The K–8 grade-level configuration among charter and traditional public schools provides robust data and a consistent model for comparison. The K–8 configuration captures all M-STEP grades in which data and a consistent model with similar financial conditions are available. For this study, K–8 grade levels are the consistent grade range for examining state assessment for English language arts (ELA, grades 3–8) across the full grade range and math (grades 3–8).

The grade-level configuration landscape in the urban area varies. The Detroit Public School Community District (traditional district) comprises multiple grade-level configurations. *Configurations* refer to whether the school is K–5, K–8, etc. Table 3.1 provides the various grade

levels within Detroit's public school landscape to provide context for the number of schools classified in a particular area. The K–8 range is the most common grade-level configuration in Detroit.

Table 3.1

Charter and Traditional School Configurations within Detroit City Limits

Type	Traditional	Charter
K–10	1	-
K–11	-	1
K–12	1	12
K–4	2	-
K–5	11	4
K–6	7	-
K–8	**41**	**30**
5–8	3	-
6–8	1	-
4–12	-	1
6–12	-	2
7–12	-	2
9–10	-	1
9–12	15	4
Total	82	57

Note: Adapted from school data retrieved from MI School Data, 2018, at www.mischooldata.org.

Similar to the Pan, Rudo, Schneider, & Smith-Hansen (2003) report, a quantitative method will be used to compare resource allocation and student performance between K–8 charter and traditional public schools in the urban area. The data sources to be used include student performance (proficiency) on the Michigan Student Test of Educational Progress (M-STEP), growth using the M-STEP, and resource allocation, which includes financial data reported to the Michigan Department of Education for 2015-2017. Figure 2 provides context for all independent and dependent variables used in the analysis. The proficiency and growth M-STEP assessments show results for English-language arts (ELA) and math. Student growth and proficiency provide the measure for ROI. The goal is to determine the relationship between

district demographics, district spending, and overall student performance on the Michigan standardized assessments (Augenblick, Palaich, & Associates Inc., 2016).

Independent Variables	Dependent Variables
Race	M-STEP (grades 3 & 5) (2014–2017) Math
No. of Economically Disadvantaged Students	M-STEP (grades 3 & 5) (2014–2017) ELA
No. of Special-Education Students	Student Growth (16-17)
Pupil-Teacher Ratio	
Total General Fund Expenditures	
Total Revenue	
Gender	

Figure 2. Independent and dependent variables.

This study will use a multiple-regression modeling series to determine the impact of multiple independent variables on a continuous dependent variable (CDV) and to predict the CDV outcome. Multiple regression extends simple linear regression, which is used when only one continuous independent variable is present. Multiple regression also allows for determination of the model's overall fit (variance explained) and the relative contribution of each of the predictors to the total variance explained (Pan, Rudo, Schneider, & Smith-Hansen, 2003; Laerd Statistics, 2015; Augenblick, Palaich, & Associates Inc., 2016).

Multiple regression allows for a relationship to be modeled between multiple independent variables and a single dependent variable, in which the independent variables are used to predict the dependent variable. Growth and proficiency will be used as the outcome. The dependent variable, or Y, is the expected value of the dependent variable, while X comprises the independent variables (predictor variables), β_0 is the constant, β_1 through β_5 are the slope coefficients (one for each variable), and ε represents the errors (Laerd Statistics, 2015). The β coefficients are the values that minimize the sum of squared errors for the equation and are used to represent the change in the mean response (Salkind, 2017). The multiple-regression models will pattern the following:

$$y_1 = b_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon$$

Using multiple regressions assumes a relationship between the independent school-level and student-level variables chosen for this study and school finance. This study's dependent variables are proficiency and growth; therefore, two regression equations exist with the exact independent variables to determine the impact on student outcomes. The model for the school type (charter and traditional public schools) includes the number of economically disadvantaged students (ED), number of special-education students (SE), gender (G), total general fund expenditures (TGF), and total revenue (TR). The multiple-regression formulas are the following:

$$\text{Proficiency} = \beta_0 + \beta_1 ED_1 + \beta_2 SE_2 + \beta_3 G_3 + \beta_4 TGF_4 + \beta_5 TR_5 + \varepsilon$$

$$\text{Growth} = \beta_0 + \beta_1 ED_1 + \beta_2 SE_2 + \beta_3 G_3 + \beta_4 TGF_4 + \beta_5 TR_5 + \varepsilon$$

The focus remains: Are charter public schools different from traditional public schools in the urban area regarding resource-allocation practices, and are the differences in spending priorities improving student performance? The following questions will assist in gathering information:

(1) Comparing charter and traditional public schools, is there a difference in student proficiency?

(2) Comparing charter and traditional public schools, is there a difference in student growth?

(3) Comparing charter and traditional public schools, is there a difference in impact from total revenue on student proficiency and growth?

(4) Comparing charter and traditional public schools, is there a difference in impact from total expenditures on student proficiency and growth?

(5) Comparing charter and traditional public schools, is there a difference of return on investment?

Each question will focus the analysis on non-directional hypotheses. The following hypotheses will guide the study:

Student Proficiency

H_{01}: Student proficiency between charter and traditional public schools is not different when compared.
H_1: Student proficiency between charter and traditional public schools is different when compared.

Student Growth

H_{02}: Student growth between charter and traditional public schools is not different when compared.
H_2: Student growth between charter and traditional public schools is different when compared.

Total Revenue

H_{03}: No significant difference exists between charter and traditional public schools' student proficiency and growth based on total revenue.
H_3: A significant difference exists between charter and traditional public schools' student proficiency and growth based on total revenue.

Total Expenditures

H_{04}: No significant difference exists between charter and traditional public schools' total expenditures on student proficiency and growth.
H_4: A significant difference exists between charter and traditional public schools' total expenditures on student proficiency and growth.

Resource Allocation

H_{05}: No difference exists between charter and traditional public schools' resource allocation.
H_5: A difference exists between charter and traditional public schools' resource allocation.

In designing this study and determining the methodology for obtaining the data, this study uses a popular context for research design (Creswell, 2017). Table 3.2 provides the

questions, the sample used to address the questions, the data for analysis, and the data-analysis process used to compare charter and traditional public schools' spending practices.

Table 3.2

Methodology

Questions	Sample	Data	Data Analyses
Comparing charter and traditional public schools, is there a difference in student proficiency?	28 charter public schools (K–8); 37 traditional public schools (K–8)	M-STEP student-performance data (14–17)*; student growth (15–17); state school-level data (14–17)	Comparison of charter and traditional public schools using *t*-tests and descriptive analysis
Comparing charter and traditional public schools, is there a difference in student growth?	28 charter public schools (K–8); 37 traditional public schools (K–8)	M-STEP student-performance data (16–17)*; student growth (15–17); state school-level data (14–17)	Comparison of charter and traditional public schools using *t*-tests and descriptive analysis
Comparing charter and traditional public schools, is there a difference in impact from total revenue on student proficiency and growth?	28 charter public schools (K–8); 37 traditional public schools (K–8)	FID financial data (14–17); M-STEP student-performance data (14–17)*; student growth (16–17); state school-level data (14–17)	Comparison of charter and traditional public schools using a series of multiple-regression models
Comparing charter and traditional public schools, is there a difference in impact from total expenditures on student proficiency and growth?	28 charter public schools (K–8); 37 traditional public schools (K–8)	FID financial data (14–17); M-STEP student-performance data (14–17)*; student growth (16–17); state school-level data (14–17)	Comparison of charter and public traditional schools using a series of multiple-regression models
Comparing charter and traditional public schools, is there a difference of return on investment?	28 charter public schools (K–8); 37 traditional public schools (K–8)	FID financial data (14–17); M-STEP student-performance data (14–17)*; student growth (16–17); state school-level data (14–17)	Comparison of charter and traditional schools using means

Note: Adapted from "Research design: Qualitative, quantitative, and mixed method approaches" by Creswell, J.W. (2017) (5th ed.). London: SAGE.
*School data retrieved from MI School Data (2018) at www.mischooldata.org.

The study's data sources are derived from various data-collection systems that the Michigan Department of Education manages. Table 3.3 provides a framework for the specific data fields used in the analysis, as well as the questions. State data system applications collect a multitude of data that include the Educational Entity Master (EEM), the Center for Educational Performance and Information (CEPI), CEPI's Financial Information Database (FID), the Michigan Student Data System (MSDS), and the MI School Data Portal for student-performance

data. To respond to the research questions, the data fields identified in Table 3.4 directly answer the questions. The variables are essential for the schools selected in the study. Variables identified in Figure 2 are available through multiple Michigan data systems, but some data points and ranges that are missing or not collected and cleaned (i.e., teacher demographics, salary, staff attendance, etc.) were excluded from the study. Also, the Michigan Department of Education has no student growth-percentile data for social studies and science available until 2022 because of a change from fall and spring testing (2014–2015), resulting in an entire missed testing cohort (MI School Data, 2018). With the lack of field information for science and social studies, these two content areas are excluded. Additionally, the study is limited to one year (2016-2017) of student-growth data because the MDE currently has only two collection periods.

Table 3.3

Data Needed for Study

Questions	Data Fields
Comparing charter and traditional public schools, is there a difference in student proficiency?	• ELA, math assessment scores; proficiency (MI School Data) • Student growth (MSDS)
Comparing charter and traditional public schools, is there a difference in student growth?	• ELA, math assessment scores; proficiency (MI School Data) • Student growth (MSDS)

Comparing charter and traditional public schools, is there a difference in impact from total revenue on student proficiency and growth?	• ELA, math assessment scores; proficiency (MI School Data)
	• Student growth (MSDS)
	• School finance expenditures (FID)
	  ○ Total revenue
	  ○ Total general fund expenditures

Comparing charter and traditional public schools, is there a difference in impact from total expenditures on student proficiency and growth?	• ELA, math assessment scores; proficiency (MI School Data)
	• Student growth (MSDS)
	• School finance expenditures (FID)
	  ○ Total revenue
	  ○ Total general fund expenditures

Comparing charter and traditional public schools, is there a difference of return on investment?	• ELA, math assessment scores; proficiency (MI School Data)
	• Student growth (MSDS)
	• School finance expenditures (FID)
	  ○ Total revenue (Bulletin 1014)
	  ○ Total general fund expenditures (Bulletin 1014)

Note: Adapted from "Research design: Qualitative, quantitative, and mixed method approaches" by Creswell, J.W., 2017 (5th ed.). London: SAGE.

Research Techniques

This study is solely quantitative and uses various existing databases. The quantitative research sources include student data collected from the CEPI, MSDS, FID (Bulletin 1014), and EEM databases, which contain all student data relevant to the study.

The statistical analysis of the ELA and math M-STEP student performance measured using growth and proficiency begins with collecting charter and traditional public schools' scores for grades three and five. The schools' data will be arranged in an Excel workbook on sheets

identified as “charter” and “traditional,” as well as a sheet that contains financial data for each school category. The data was combined onto one sheet for arranging and importing to the Statistical Package for the Social Sciences (SPSS). While most of the data analysis was completed in SPSS, Excel contained the raw data. The student-performance scores were collected by the Michigan Department of Education’s Office of Strategic Research and provided in an Excel file. Again, student proficiency and growth are delineated by English language arts (ELA) and math.

Independent *t*-tests were used to determine the difference between charter and traditional public schools’ M-STEP means. The purpose of the *t*-test is to determine the difference between the two entities (Laerd Statistics, 2015). The measures of central tendency, dispersion, and frequency distribution of the M-STEP scores for charter and traditional public schools summarize the data and also provide a set of parameters with which to measure the difference for each year (2014-2017). Again, comparisons of M-STEP proficiency (14-17) and growth (16-17) in ELA and math were conducted using independent *t*-tests for each school year.

These three years of scores were used because the M-STEP was implemented from 2014–2017 at the time of this study. The first year was a pilot year for Michigan. A table represents the mean comparisons of M-STEP student performance between charter and traditional public schools. Tables comparing charter public schools with traditional public schools represent the results of the analysis.

Across the research questions, M-STEP data from grades three and five was collected to discover differences in the proficiency and growth for ELA and math from 2014-2017. The sample included n=65 charter public schools (PSA) and traditional public schools (LEA) from grades K–8. The schools are distinguished by PSA (n=28) and LEA (n=37). The M-STEP scores

were collected for all schools within the profile, which refers to urban charter and traditional public schools; K–8, over 90 percent African American enrollment; similar sizes of enrollment; highly economically disadvantaged students as defined by the Title I levels; and students who receive, minimally, three of the four levels of Title I funding that include basic, concentration, targeted, and education finance incentive grants (U.S. Department of Education, 2016).

The financial data fields of total revenue and total expenditures that the districts reported were used in multiple-regression models as independent variables in which growth and proficiency are the dependent variables. The proficiency and growth M-STEP assessment provided results for ELA and math. In various multiple-regression models, each year of reported finance data (total revenue and total expenditures), ELA, math scores for third and fifth grades, growth, and proficiency were examined.

For a multiple regression, this study met specific assumptions that include a linear relationship between the dependent variable and the independent variables and these same variables collectively; the dependent variable measured on a continuous scale; two or more independent variables that can be continuous or categorical (i.e., race, gender, etc.); independence of observation (unrelated); and data needed to show variances along the line of best fit as being similar. All analyses was completed in SPSS and used an alpha level of .05 (95 percent) to determine statistical significance. The alpha level of .05 is used to reduce the outcome of a Type I error (false positive) for a more plausible result.

This study also addressed resource allocation or cost effectiveness. Booker, Gilpatric, Gronberg, and Jansen (2008) and Gronberg, Jansen, and Taylor (2012) have provided context for researchers to develop cost-effectiveness approaches to examine charter and traditional public schools' finances. This approach assesses education productivity. Cost-effectiveness models

typically are designed by the function and submodels associated with the model. Table 3.4 provides a framework of this study's cost-effectiveness model when determining ROI or the resource-allocation model's efficacy (Booker, Gilpatric, Gronberg, & Jansen, 2008). This study used the framework to determine effort (resource allocation), short- and long-term effects or impacts to the model, and production that determines whether the model is efficient. If the model is not efficient, the methodology is revised in a continuous improvement cycle for quality assurance.

Table 3.4

School Cost-Effectiveness Model

FUNCTION	**SUBMODEL**
Effort	Resource allocation
Immediate effects	Economically disadvantaged students Number of special-education students Enrollment Race Pupil-Teacher Ratio Total General Fund Expenditures Total Revenue
Longer Range Effects	Student Performance
Production	Efficacy

Note: Adapted from "The relative efficiency of charter schools: A cost frontier approach" by Gronberg, T. J., Jansen, D. W., & Taylor, L. L, 2012, *Economics of Education Review, 31*(2), p. 302–317 and "*School outcomes and school costs: A technical supplement"* by Gronberg, T. J., Jansen, D. W., Taylor, L., & Booker, T. K., 2005.

Effort is the overall goal, and production is the outcome that the model seeks to achieve. This study applied schools' cost-effectiveness models to examine ROI by comparing charter public schools with traditional public schools.

Research Ethics

The researcher would ensure that appropriate research ethics are followed during the study. There was no student-level data used for this study. Data was extracted from public

databases. Thus, the study is exempt per the notice of determination “Not Regulated” status (see Appendix A).

Chapter 4: Results

Introduction

This study's objective is to understand the differences between charter and traditional public schools in Michigan regarding resource-allocation practices and their impact on student performance. Charter and traditional public schools' resource-allocation practices were analyzed to determine how allocation of educational services—including instruction, operations, and facilities management—relates to improving student performance. Given the demographics of the schools studied, the data analysis further examined whether a marketplace-competition policy serves Michigan's underserved students effectively. With data that provide context for resource-allocation practices and the outcome of these practices on student performance, the analysis delivers a better understanding of the marketplace policy's impact in Michigan.

This study specifically sought to answer five research questions:

(1) Comparing charter and traditional public schools, does a difference exist in student proficiency?

(2) Comparing charter and traditional public schools, does a difference exist in student growth?

(3) Comparing charter and traditional public schools, does a difference exist in total revenue's impact on student proficiency and growth?

(4) Comparing charter and traditional public schools, does a difference exist in total expenditures' impact on student proficiency and growth?

(5) Comparing charter and traditional public schools, does a difference exist in return on investment?

A quantitative study was conducted to explore the differences between charter and traditional public schools' resource-allocation practices. The methodology partially replicated the Pan, Rudo, Schneider, and Smith-Hansen (2003) study which examined the relationship between resource allocation and student performance. In addition, the Booker, Gilpatric, Gronberg, and Jansen (2008) study which examined whether charter public schools operate more cost-effectively and yield better educational outcomes than traditional public schools per capita further influenced the present study's design. This study added the additional variable of school finance and incorporated it into its multiple-regression analysis to determine the fiscal efficiency of resource allocation.

Charter and Traditional Public School Variables

This study examined several descriptive variables to gain a better understanding of the environment being studied. These variables include the subgroup means of enrollment, gender, grade, number of economically disadvantaged students, number of special-education students, student-teacher ratio, full-time equivalent, assessment data (growth and proficiency), total general fund expenditures, and total revenue. These data provide the study's fundamental variables before addressing the research questions.

All means, medians, and standard deviations are calculated by using SPSS statistical software for student enrollment, grade, number of economically disadvantaged students, number of special-education students, student-teacher ratio, full-time equivalent, assessment data (growth and proficiency), total general fund expenditures, and total revenue. SPSS also generated the results of the independent samples t-tests, and the regressions.

Population Descriptive Statistics. This study compares a large urban area charter and traditional public schools' resource-allocation practices, as well as its charter and traditional public schools' operational expense. More specifically, district revenue and expenditures are examined. Charter public are typically single site districts. Each building is an independent school district. In Michigan, charter public schools primarily serve African-American students (Lacireno-Paquet, Holyoke, Moser, & Henig, 2002; U.S. Department of Education, n.d.; Binelli, 2017), therefore, the study examines factors that affect predominantly African-American students.

This study's population is spread throughout 60 schools in a large urban center of which 28 are charter public schools and 37 are traditional public schools. The schools studied include K-8 elementary schools within an urban center comprising an African American student enrollment of over 90 percent. Students in these schools are highly disadvantaged economically, based on Title I levels that include basic, concentration, targeted, and education finance-incentive grants (U.S. Department of Education, 2016).

Subgroup means. The subgroups for this study are school type, number of economically disadvantaged students, number of special-education students, gender, total general fund expenditures, and total revenue. The mean, median, and standard deviation are represented for each subgroup. The bold-face means in the following tables represent greater means when comparing charter and traditional public schools. Table 4.1 provides average enrollment data of charter and traditional public schools. Charter public schools register higher average overall enrollment.

Table 4.1

Comparison of Charter and Traditional Public School Average Enrollment (2014-2017)

Enrollment	School Type	# of Schools	Mean	Median	Standard Deviation
Total	Traditional	37	488.97	475.00	178.95
	Charter	28	**502.96**	469.50	236.56

Traditional – Traditional Public Schools

Charter - Charter Public Schools

Table 4.2 provides enrollment averages in K-8 grade levels for school years 2014-2017 and a comparison of charter and traditional public school average enrollment by gender. Charter public schools register a greater average overall female enrollment in this study. Traditional public schools register a greater male enrollment.

Table 4.2

Comparison of Charter and Traditional Public School Average Enrollment by Gender (2014-2017)

Enrollment	School Type	Mean	Median	Standard Deviation
Male	Traditional	**257.76**	253.00	94.73
	Charter	256.42	242.50	119.35
Female	Traditional	231.21	212.00	85.754
	Charter	**246.54**	229.50	118.69

Traditional – Traditional Public Schools

Charter - Charter Public Schools

Table 4.3 provides a comparison of charter and traditional public school average enrollment by grade level. Comparatively, charter public schools register higher enrollment in kindergarten through fifth grade. Traditional public schools register greater enrollment in sixth through eighth grades.

Table 4.3

Comparison of Charter and Traditional Public School Average Enrollment by Grade (2014-2017)

Enrollment	School Type	Mean	Median	Standard Deviation
Kindergarten	Traditional	54.44	51.00	21.20
	Charter	**60.69**	65.00	29.52
Grade 1	Traditional	59.32	55.00	23.48
	Charter	**61.58**	59.50	29.46
Grade 2	Traditional	54.26	53.00	23.01
	Charter	**58.65**	56.00	29.33
Grade 3	Traditional	52.04	51.50	22.92
	Charter	**57.96**	49.50	29.66
Grade 4	Traditional	51.45	49.00	23.25
	Charter	**57.46**	63.00	27.17
Grade 5	Traditional	52.53	49.00	22.18
	Charter	**57.31**	54.50	26.87
Grade 6	Traditional	**55.03**	48.50	29.57
	Charter	53.08	49.50	25.74
Grade 7	Traditional	**55.95**	48.50	26.12
	Charter	49.96	47.50	25.48
Grade 8	Traditional	**53.95**	43.00	29.83
	Charter	46.27	35.00	27.13

Traditional – Traditional Public Schools

Charter - Charter Public Schools

Table 4.4 provides a comparison of charter and traditional public school average enrollment of economically disadvantaged students. Economically disadvantaged enrollment for charter public schools is higher than traditional public schools.

Table 4.4

Charter and Traditional Public School Average Enrollment of Economically Disadvantaged Students (2014-2017)

Enrollment	School Type	# of Schools	Mean	Median	Standard Deviation
Economically Disadvantaged	Traditional	37	414.76	390.00	156.33
	Charter	28	**467.88**	428.50	225.68

Traditional – Traditional Public Schools

Charter - Charter Public Schools

Table 4.5 provides a comparison of charter and traditional public school average enrollment by special-education students. The overall population of special education students in traditional schools more than twice that in charter schools. On average per school, about 19 percent of traditional students and 10 percent of charter students are special education.

Table 4.5

Comparison of Charter and Traditional Public School Average Enrollment by Special Education (2014-2017)

Enrollment	School Type	# of Schools	Mean	Median	Standard Deviation
Special Education	Traditional	37	**92.18**	76.00	76.72
	Charter	28	50.31	47.50	26.75

Traditional – Traditional Public Schools

Charter - Charter Public Schools

Student-to-teacher ratio and full-time equivalent. The mean for student-to-teacher ratio when comparing charter and traditional public schools is slightly higher for traditional public schools. Charter public schools student to teacher ratio is 25 and traditional public schools student to teacher ratio is 28. Full-time equivalent (FTE) is a unit that measures

employee's time to make them comparable. One FTE is equivalent to one employee working full-time (www.businessdictionary.com/definition). FTE provides a size context when comparing traditional public schools with charter public schools used in this study (U.S. Department of Education, 2011). Figure 1 depicts the amount of teacher FTEs reported on average between traditional public schools and charter public schools by comparing FTEs and student to teacher ratio.

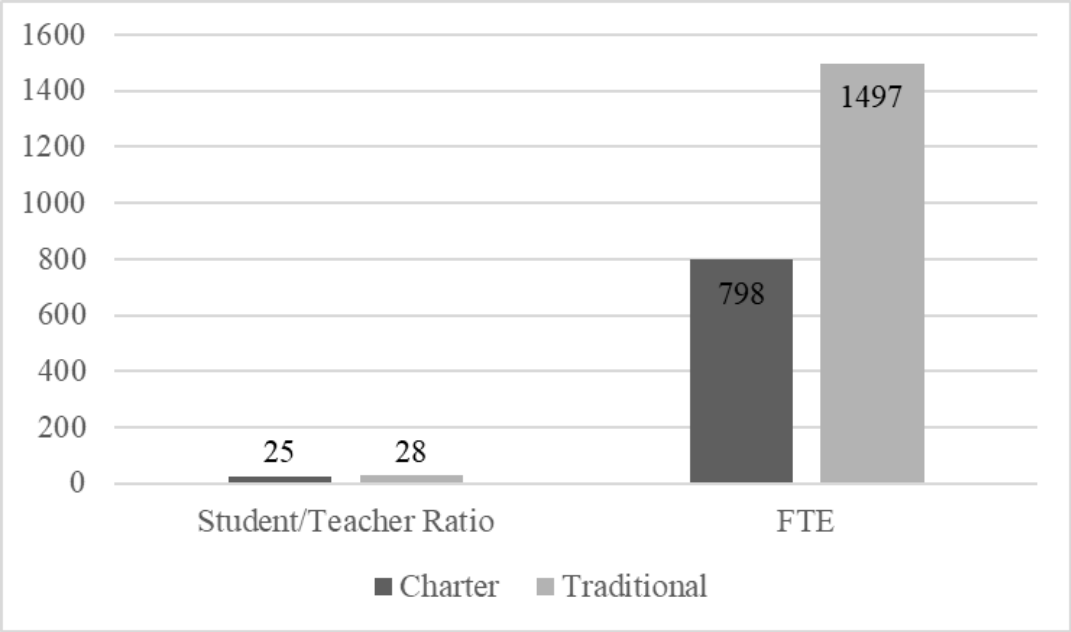

Figure 1. Comparison of charter and traditional public schools' student-to-teacher ratio and teacher FTE averages (2014-2017)

Table 4.6 provides data on student-to-teacher ratios from 2014-2017 to compare differences between charter and traditional public schools used in this study. In the 2014-2015 school year, the student-teacher ratio for traditional public schools was higher than charter public schools. In the 2015-2016 school year, the student-teacher ratio was the same. This shift in enrollment is attributable to the growing number of charter public schools and the unstable financial condition in traditional urban public schools (Citizens Research Council of Michigan,

2012; Binelli, 2017). By the 2016-2017 school year, the student-teacher ratio for traditional public schools was one point higher than charter public schools. Student to teacher ratio is included in the regression analysis to determine any impact on proficiency, growth, revenue, and expenditures.

Table 4.6

Comparison of Charter and Traditional Public Schools' Student-to-Teacher Ratios (2014-2017)

School Type	2014-2015 Student-Teacher Ratio	2015-2016 Student-Teacher Ratio	2016-2017 Student-Teacher Ratio
Traditional	31:1	24:1	30:1
Charter	22:1	24:1	29:1

Traditional – Traditional Public Schools
Charter - Charter Public Schools

Assessment. The Michigan Student Test of Educational Progress (M-STEP) is the assessment used for determining student proficiency and growth. The M-STEP for grades three and five are administered for English language arts and mathematics. Once each year, the M-STEP measures proficiency of content area knowledge of Michigan's public school children. Proficiency is determined at individual content areas and students do not have to be proficient in all areas at all times.

Students who are eligible to complete the assessment are general education public school students (Michigan Department of Education, 2019). Special education students do not take the M-STEP, as they are required to take an alternate test (Michigan Department of Education, 2019). There are also those students who have tested but the tests are not reportable due to incomplete assessments; medical reasons; incomplete, incorrect, or missing enrollment data; or the student has an improper accommodation for the need or disorder. Invalid tests are also

removed from the aggregate score which includes students who were provided the wrong test, suspended, had an incomplete student assessment, or were not enrolled at the school being tested (Michigan Department of Education, 2019). Thus, enrollment numbers and those tested will be vastly different and has been an issue in the urban area (E. Bolig, personal communication, August 18, 2018).

The M-STEP scale scores are described in levels as *Not Proficient, Partially Proficient, Proficient,* or *Advanced* (Michigan Department of Education, 2018). The divisions between the levels often are referred to as cut scores. The *Advanced* descriptor means academic content standards were exceeded, indicating substantial understanding and application of key concepts. The *Proficient* descriptor indicates that the student's performance shows an understanding and application of key academic content standards. The *Partially Proficient* descriptor indicates that the student's performance is not yet proficient and shows a partial understanding and application of key academic content. The *Not Proficient* descriptor indicates that the student shows minimal understanding and application of key academic content.

The M-STEP consists of a multiple-choice section and a constructed written response section which results in a scaled score. The scaled score is "calculated from a total number of obtained score points, statistically adjusted and converted into a consistent, standardized scale that permits direct and fair comparisons of scores from different forms of a test, either within the same administration year or across years" (Tan & Michel, 2011). The M-STEP does not use percent-correct scores as the primary scale for reporting assessment results because such scores are not comparable across forms (Tan & Michel, 2011).

Content areas. For this study's purposes, each content area is coded. English language arts for grade three is coded EG3, math grade three is MG3, English language arts grade five is

coded EG5, and math grade five is coded MG5. The coded content areas were used in the student scoring level data analysis. This study focused directly on the *Proficient* and *Not Proficient* levels when comparing charter and traditional public schools. The rationale for examining those two categories is due to the Michigan Department of Education's *School Accountability System for the Top 10 in 10 Years*. The plan seeks to examine the number of students moving from *Not Proficien*t to *Proficient* levels (Michigan Department of Education, 2018).

In Tables 4.7, 4.8, 4.9, and 4.10, means are reported, each of which represent the average number of students at each scoring level in a typical school. The tables represent school years 2014-2017.

In Table 4.7, the means are higher for charter public schools (4.13) compared with traditional public schools (0.80) for EG3 total Advanced. The means are higher for charter public schools (7.42) compared with traditional public schools (2.55) for EG3 total Proficient. The means are higher for charter public schools (13.36) compared with traditional public schools (7.75) for EG3 total Partially Proficient. The means are higher for traditional public schools (38.63) compared with charter public schools (28.81) for EG3 total Not Proficient.

Table 4.7

Students' M-STEP EG3 Score Level for Years 2014-2017

Subject	Score Level	School Type	Average # of Students
EG3	Total Advanced	Traditional	0.80
		Charter	**4.13**
	Total Proficient	Traditional	2.55
		Charter	**7.42**
	Total Partially Proficient	Traditional	7.75
		Charter	**13.36**
	Total Not Proficient	Traditional	**38.63**
		Charter	28.81

Traditional – Traditional Public Schools
Charter - Charter Public Schools

In Table 4.8, the means are higher for charter public schools (1.69) compared with traditional public schools (0.59) for MG3 total *Advanced*. The means are higher for charter public schools (7.97) compared with traditional public schools (3.44) for MG3 total *Proficient*. The means are higher for charter public schools (16.02) compared with traditional public schools (9.17) for MG3 total *Partially Proficient*, and the means are higher for traditional public schools (35.52) compared with charter public schools (28.04) for MG3 total *Not Proficient*.

Table 4.8

Students' M-STEP MG3 Score Level for Years 2014-2017

Subject	Score Level	School Type	Average # of Students
MG3	Total Advanced	Traditional	0.59
		Charter	**1.69**
	Total Proficient	Traditional	3.44
		Charter	**7.97**
	Total Partially Proficient	Traditional	9.17
		Charter	**16.02**
	Total Not Proficient	Traditional	**35.52**
		Charter	28.04

Traditional – Traditional Public Schools
Charter - Charter Public Schools

In Table 4.9, the mean scores are higher for charter public schools (2.78) compared with traditional public schools (0.43) for EG5 total *Advanced*. The mean scores are higher for charter public schools (9.79) compared with traditional public schools (2.82) for EG5 total *Proficient*. The mean scores are higher for charter public schools (13.69) compared with traditional public schools (7.43) for EG5 total *Partially Proficient*. The mean scores are higher for traditional public schools (33.60) compared with charter public schools (25.16) for EG5 total *Not Proficient*.

Table 4.9

Students' M-STEP EG5 Score Level for Years 2014-2017

Subject	Score Level	School Type	Average # of Students
EG5	Total Advanced	Traditional	0.43
		Charter	**2.78**
	Total Proficient	Traditional	2.82
		Charter	**9.79**
	Total Partially Proficient	Traditional	7.43
		Charter	**13.69**
	Total Not Proficient	Traditional	**33.60**
		Charter	25.16

Traditional – Traditional Public Schools
Charter - Charter Public Schools

In Table 4.10, means are higher for charter public schools (1.25) compared with traditional public schools (0.10) for MG5 total *Advanced*. The means are higher for charter public schools (3.34) compared with traditional public schools (0.48) for MG5 total *Proficient*. The means are higher for charter public schools (12.58) compared with traditional public schools (4.95) for MG5 total *Partially Proficient*. The means are higher for traditional public schools (38.71) compared with charter public schools (33.59) for MG5 total *Not Proficient*.

Table 4.10

Students' M-STEP MG5 Score Level for Years 2014-2017

Subject	Score Level	School Type	Average # of Students
MG5	Total Advanced	Traditional	0.10
		Charter	**1.25**
	Total Proficient	Traditional	0.48
		Charter	**3.34**
	Total Partially Proficient	Traditional	4.95
		Charter	**12.58**
	Total Not Proficient	Traditional	**38.71**
		Charter	33.59

Traditional – Traditional Public Schools

Charter - Charter Public Schools

Revenue and Expenditures

In Michigan, charter public schools have more autonomy than traditional public schools in controlling their budgets, staffing levels, curricula, and lengths of school day and year (Zimmer, Gill, Booker, Lavertu, & Witte, 2012). Comparing charter and traditional public schools at the district level in this study's urban area provides context for the amount of funding provided. The categories include number of full-time equivalent units (FTEs), total revenue, and total expenditure per student.

Full-time equivalent. A full-time equivalent (FTE) is a unit that measures employee's time to make them comparable to the number of hours that one employee works, represented as 1.0, and equals a full-time worker. Half of an FTE represents 0.5 and signals half-time work (U.S. Department of Education, 2011). FTE provides context for the amount of positions needed to cover the student population. Table 4.11 provides the total and mean of the traditional public district, as well as the total and mean of the charter public districts, and

represents the average number of teacher FTEs in charter and traditional public schools in this study. The traditional public school district represents an average teacher FTE of 1,500 for the 2014-2015 school year, 1,528 for the 2015-2016 school year, and 1,465 for the 2016-2017 school year. The charter public school districts are comprised of multiple districts with 830 teacher FTEs for the 2014-2015 school year, multiple districts with 774 FTEs for the 2015-2016 school year, and multiple districts with 832 FTEs for the 2016-2017 school year.

Table 4.11

Charter and Traditional Public School District Teacher Full-Time Equivalent Units for 2014-2017

School Type	2014-2015 Teacher FTE	2015-2016 Teacher FTE	2016-2017 Teacher FTE
Traditional	1,500	1,528	1,465
Charter	830	774	832

Traditional – Traditional Public Schools
Charter - Charter Public Schools

Table 4.12 represents the average FTE for charter and traditional public schools in Michigan. The traditional public schools in this study total 37 and represent an FTE of 48,574 for the 2014-2015 school year, 47,487 FTE for the 2015-2016 school year, and 45,179 for the 2016-2017 school year. The numbers provide context for the size comparison between charter and traditional public schools. Charter public schools comprise multiple districts at 600 FTEs for the 2014-2015 school year, 555 FTEs for the 2016-2017 school year, and 658 FTEs for the 2016-2017 school year. The table represents the FTEs the 37 traditional public school district used for

this study, and the 28 charter public school districts. Per Michigan Compiled Law (MCL) 380.501, part 6A, a charter school can be a single site district and building.

Table 4.12

Charter and Traditional School District Total Full-Time Equivalent Units (2014-2017)

School Type	2014-2015 FTE	2015-2016 FTE	2016-2017 FTE
Traditional	49,361	47,896	46,261
Charter	17,216	16,141	17,986

Traditional – Traditional Public Schools
Charter - Charter Public Schools

Total revenue. Total revenue represents all funding resources that districts receive. Traditional public schools have a greater number of FTEs, so they register higher total general funding revenue. Table 4.13 provides a breakdown of the funding received by school types. The traditional public school districts used within this study received an annual average of $682,508,878 for the 2014-2017 school years. Charter public school districts received an annual average of $173,250,931 for the 28 charter public schools in this study.

Table 4.13

Charter and Traditional School District General Fund Total Revenue (2014-2017)

School Type		2014-2015 General Fund Total Revenue	2015-2016 General Fund Total Revenue	2016-2017 General Fund Total Revenue
Traditional	Sum	$667,558,480	$698,428,459	$666,589,296
Charter	Sum	$165,745,863	$153,329,289	$200,677,642

Traditional – Traditional Public Schools
Charter - Charter Public Schools

Total revenue per student. Total revenue per student represents how funding resources are allotted per student in attendance within the district per the number of students. Resources include state funding allotted based on the modified foundation system in Michigan, as well as special-education funding and millages. A modified funding stream is a state system that supplies school funding based on student counts (Michigan Department of Treasury, 2002). School districts receive funding for each student that attends (Michigan Department of Treasury, 2002). Table 4.14 provides a breakdown of the funding received per student by charter and traditional public schools. Between 2014 and 2017, there was an increase in traditional public schools' overall total of $14,402 for 2014-17, or an average of $4,800 per year. The average charter public school received $9628 overall for 2014-17, or $3209 per year. Therefore, traditional public schools received $1,591 more in student funding.

Table 4.14

Charter and Traditional School District Total Revenue Per Student (2014-2017)

School Type	2014-2015 General Fund Total Revenue Per Student	2015-2016 General Fund Total Revenue Per Student	2016-2017 General Fund Total Revenue Per Student
Traditional	$13,743	$14,708	$14,754
Charter	$9,502	$9,430	$9,952

Traditional – Traditional Public Schools
Charter - Charter Public Schools

Expenditures. The previous section provided context for the amount of funding that charter and traditional public schools receive. This section represents the categories of total instructional expenditures, instructional staff support, administration, operations and maintenance, and general fund expenditures. Table 4.15 provides funds expended between

charter and traditional public schools when examining multiple-expenditure areas. The table includes sum funding for the traditional public school district and the overall sum of all charter public schools. A single charter public school building is considered a single site district.

Table 4.15

Charter and Traditional School District Total Instruction Expenditures (2014-2017)

School Type		2014-2015 Total General Fund Expenditures	2015-2016 Total General Fund Expenditures	2016-2017 Total General Fund Expenditures
Traditional	Sum	$714,030,093	$734,083,797	$587,898,328
Charter	Sum	$165,580,745	$153,221,783	$201,414,733

Traditional – Traditional Public Schools
Charter - Charter Public Schools

Total instructional expenditures. Total instructional expenditures are the amount of funds allotted to provide instructional services to students. Table 4.16 provides a breakdown of funds expended between charter and traditional public schools. Traditional public schools expended an average of $314,244,066 for the years 2014-17. Charter public schools expended over $71,796,327 on average for the years 2014-2017.

Table 4.16

Charter and Traditional Public School District Total Instruction Expenditures (2014-2017)

School Type		2014-2015 Total Instruction Expenditures	2015-2016 Total Instruction Expenditures	2016-2017 Total Instruction Expenditures	2014-2017 Sum
Traditional	Sum	$336,345,713	$304,795,807	$301,590,678	$942,732,198
Charter	Sum	$72,853,739	$65,976,872	$76,558,371	$215,388,982

Traditional – Traditional Public Schools
Charter - Charter Public Schools

Total instructional staff support expenditures. Total instructional staff support represents the amount of funding allocated for supporting instruction, which includes professional development, conferences, and training. Table 4.17 represents the total amount of funds expended on staff support. A single charter public school is considered a single site district.

Table 4.17

Charter and Traditional Public School District Total Instructional Staff Support (2014-2017)

School Type		2014-2015 Total Instructional Staff Support	2015-2016 Total Instructional Staff Support	2016-2017 Total Instructional Staff Support
Traditional	Sum	$114,474,959	$127,186,270	$95,765,590
Charter	Sum	$14,677,811	$15,581,078	$18,887,077

Traditional – Traditional Public Schools
Charter - Charter Public Schools

Administration. The administration represents the amount of funding allocated for supporting administration related to school administrators, including superintendents, principals,

curriculum directors, special-education directors and supervisors, and assistant principals. Table 4.18 provides the amount expended to administration for charter and traditional public schools.

Table 4.18

Charter and Traditional Public School District Total Administration (2014-2017)

School Type		2014-2015 Total Administration	2015-2016 Total Administration	2016-2017 Total Administration
Traditional	Sum	$93,061,355	$111,280,319	$71,452,649
Charter	Sum	$34,560,309	$34,139,319	$38,274,553

Traditional – Traditional Public Schools
Charter - Charter Public Schools

Total operations and maintenance. Total operations and maintenance represent the amount of funding allocated for operations of school districts and maintenance for various school-related properties, such as heating and cooling, print services, and building maintenance. Table 4.19 provides the amount of funding expended in this category for charter and traditional public schools.

Table 4.19

Charter and Traditional Public School District Total Operations and Maintenance (2014-2017)

School Type		2014-2015 Total Operations and Maintenance	2015-2016 Total Operations and Maintenance	2016-2017 Total Operations and Maintenance
Traditional	Sum	$79,161,817	$86,651,980	$77,443,243
Charter	Sum	$30,744,234	$24,001,471	$26,497,350

Traditional – Traditional Public Schools

Charter - Charter Public Schools

Research Question One

The initial research question asks whether a difference exists in student proficiency when comparing charter and traditional public schools. In this study, there were 37 traditional public schools and 28 charter public schools at the K-8 grade levels. An independent sample t-test was used to determine whether any differences existed between charter and traditional public school students. The dataset is from school years 2014-2015, 2015-2016, and 2016-2017, and the unit of analysis is the district.

2014-2015 student proficiency. A statistically significant difference exists in student proficiency between charter and traditional public school EG3 students, with charter public school students scoring higher than traditional public school students [$t(38) = -3.073$, $p = .003$]. The EG3 student proficiency for charter public schools ($M = 7.65$; $SD = 1.216$) is higher than traditional public schools ($M = 3.56$; $SD = .682$) (see Figure 2). A statistically significant difference exists in student proficiency between charter and traditional public school MG3 students, with charter public school students scoring higher than traditional public school students [$t(56) = -2.561$, $p = .013$]. The MG3 student proficiency for charter

public schools (M = 8.36; SD = 7.952) was higher than traditional public schools (M = 4.21; SD = 4.226) (see Figure 2).

A statistically significant difference exists in student proficiency between charter and traditional public school EG5 students, with charter public school students scoring higher than traditional public school students [t(55) = -3.652, p = .001]. The EG5 student proficiency for charter public schools (M = 9.08; SD = 9.338) is higher than traditional public schools (M = 2.71; SD = 2.479) (see Figure 2). A statistically significant difference existed in student proficiency between charter and traditional public school MG5 students, with charter public school students scoring higher than traditional public school students [t(55) = -3.722, p = .000]. The MG5 student proficiency for charter public schools (M = 4.22; SD = 5.402) was higher than traditional public schools (M = 0.1; SD = .731) (see Figure 2).

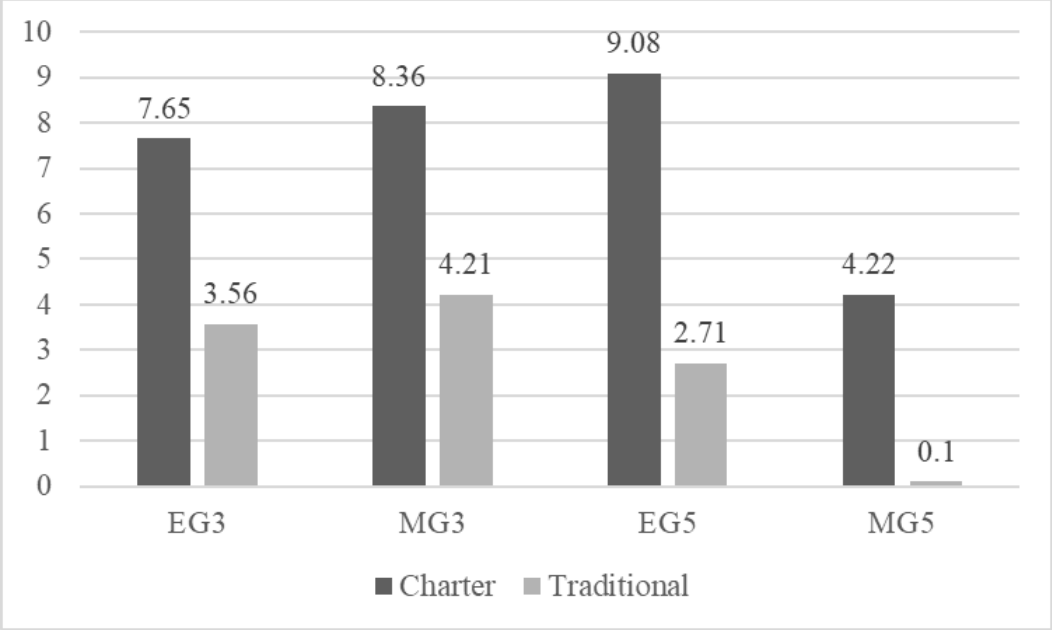

Figure 2. Comparison of charter and traditional public schools' content proficiency (2014-2015)

Overall, a statistically significant difference exists between means ($p < .05$) for EG3, MG3, EG5, and MG5; therefore, the null hypothesis is rejected, and the alternative hypothesis is accepted, asserting that student proficiency during the 2014-2015 school year between charter and traditional public schools is different when compared.

2015-2016 student proficiency. A statistically significant difference exists in student proficiency between charter and traditional public school EG3 students, with charter public school students scoring higher than traditional public school students [$t(60) = -4.079$, $p = .000$]. The EG3 student proficiency for charter public schools ($M = 7.12$; $SD = 7.310$) is higher than traditional public schools ($M = 2.03$; $SD = 1.771$) (see Figure 3). A statistically significant difference exists in student proficiency between charter and traditional public school MG3 students, with charter public school students scoring higher than traditional public school students [$t(60) = -3.758$, $p = .000$]. The MG3 student proficiency for charter public schools ($M = 7.52$; $SD = 6.905$) is higher than traditional public schools ($M = 2.62$; $SD = 3.235$) (see Figure 3).

A statistically significant difference exists in student proficiency between charter and traditional public school EG5 students, with charter public school students scoring higher than traditional public school students [$t(58) = -4.277$, $p = .000$]. The EG5 student proficiency for charter public schools ($M = 9.84$; $SD = 9.677$) is higher than traditional public schools ($M = 2.66$; $SD = 2.014$) (see Figure 3). A statistically significant difference exists in MG5 student proficiency between charter and traditional public schools, with charter public school students scoring higher than traditional public school students [$t(59) = -3.100$, $p = .000$]. The MG5 student proficiency for charter public schools ($M = 2.92$; $SD = 4.804$) is higher than traditional public schools ($M = 0.39$; $SD = .871$) (see Figure 3).

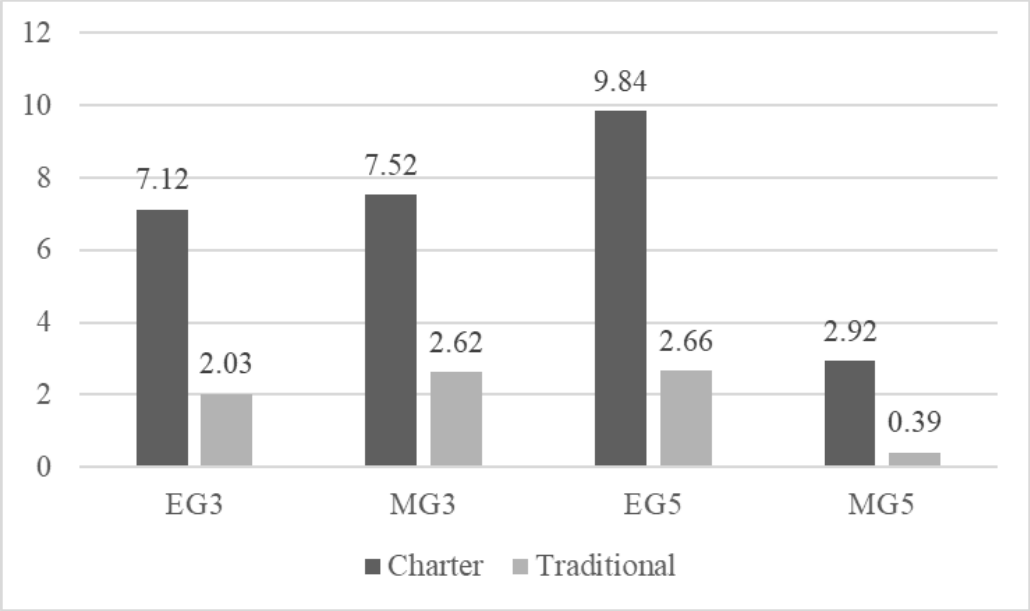

Figure 3. Comparison of charter and traditional public schools' content proficiency (2015-2016)

Overall, a statistically significant difference exists between means ($p < .05$) for EG3, MG3, EG5, and MG5; therefore, the null hypothesis is rejected, and the alternative hypothesis is accepted, asserting that student proficiency during the 2015-2016 school year between charter and traditional public schools is different when compared.

2016-2017 student proficiency. A statistically significant difference in student proficiency exists between charter and traditional public school EG3 students, with charter public school students scoring higher than traditional public school students [$t(56) = -3.669$, $p = .001$]. The EG3 student proficiency for charter public schools ($M = 7.50$; $SD = 7.845$) is higher than traditional public schools ($M = 2.06$; $SD = 2.699$) (see Figure 4). A statistically significant difference exists in student proficiency between charter and traditional public school MG3 students, with charter public school students scoring higher than traditional public school students [$t(56) = -2.867$, $p = .006$]. The MG3 student proficiency for charter public

schools (M = 8.04; SD = 6.750) is higher than traditional public schools (M = 3.50; SD = 5.310) (see Figure 4).

A statistically significant difference exists in student proficiency between charter and traditional public school EG5 students, with charter public school students scoring higher than traditional public school students [t(55) = -4.455, p = .000]. The EG5 student proficiency for charter public schools (M = 10.46; SD = 8.617) is higher than traditional public schools (M = 3.10; SD = 2.993) (see Figure 4). A statistically significant difference existed in student proficiency between charter and traditional public school MG5 students, with charter public school students scoring higher than traditional public school students [t(55) = -3.289, p = .002]. The MG5 student proficiency for charter public schools (M = 2.88; SD = 3.892) is higher than that of traditional public schools (M = .55; SD = .675) (see Figure 4).

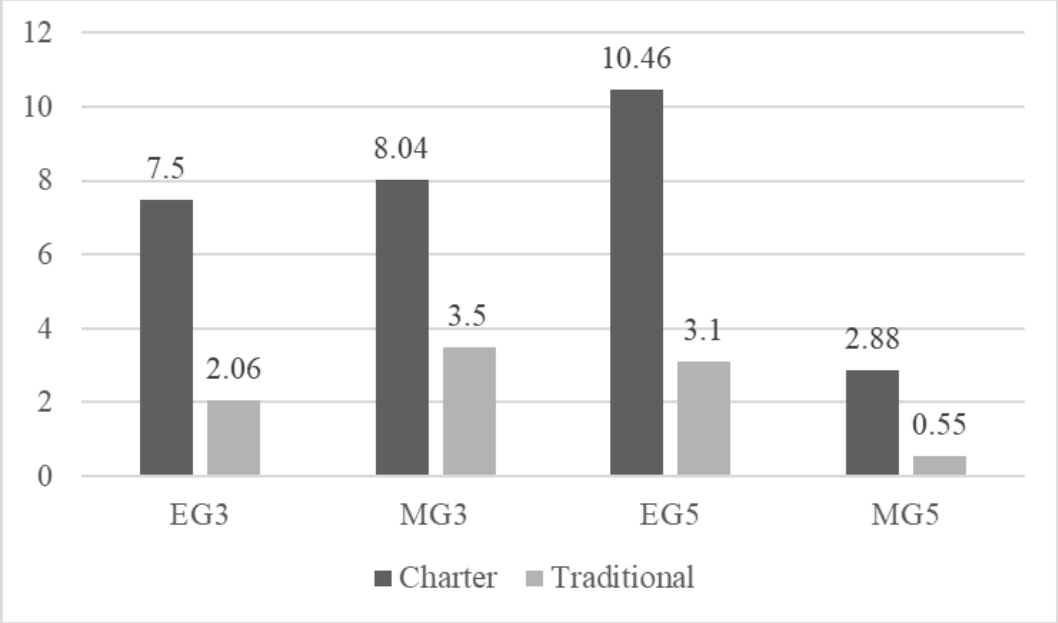

Figure 4. Comparison of charter and traditional public schools' content proficiency (2016-2017)

Overall, a statistically significant difference exists between means ($p < .05$) for EG3, MG3, EG5, and MG5; thus, the null hypothesis is rejected, and the alternative hypothesis is accepted, asserting that student proficiency during the 2016-2017 school year between charter and traditional public schools is different when compared.

Research Question Two

This research question asks whether a difference exists in student growth when comparing charter and traditional public schools. There were 37 traditional public schools and 28 charter public schools at the K-8 grade levels used for the analysis of the fifth-grade student-growth dataset. The dataset analysis is for the 2016-2017 school year only because the Michigan Department of Education had only one year of data available for student growth at the fifth-grade level.

2016-2017 growth. A statistically significant difference exists in student growth between charter and traditional public school EG5 students, with charter public school students scoring higher than traditional public school students [$t(57) = -4.319$, $p = .000$]. The EG5 student growth for charter public schools ($M = 50.42$; $SD = 8.196$) is higher than traditional public schools ($M = 41.89$; $SD = 6.978$). No statistically significant difference in student growth between charter and traditional public school students exists, with charter public school students scoring higher than traditional public school students [$t(57) = -1.884$, $p = .065$]. The MG5 student growth for charter public schools ($M = 46.97$; $SD = 11.123$) is slightly higher than that of traditional public schools ($M = 41.61$; $SD = 10.708$).

A statistically significant difference exists between means ($p < .05$) of EG5; thus, the null hypotheses is rejected, and the alternative hypothesis is accepted, asserting that student growth during 2016-2017 between charter and traditional public schools is different when

compared. However, no statistically significant differences were found between means (p >.05) of MG5; thus, the null hypothesis is accepted and the alternative hypothesis is rejected, with no difference existing in student growth between charter and traditional public schools when compared.

Research Question Three

Revenue. This question asked whether a difference existed when comparing charter and traditional public schools' total support impact on student proficiency and growth for school years 2014-2017. The independent variables used in the analysis include the number of economically disadvantaged students, number of special-education students, school type, gender, total revenue, and total expenditures. The formula that incorporates the independent variables and dependent variables are referred to as the model or what is being tested in a regression model. There are a several measures that determine whether the multiple regression model is a good fit for the data. These are: (a) the multiple correlation coefficient (R), (b) the percentage (or proportion) of variance explained; (c) the statistical significance of the overall model; and (d) the precision of the predictions from the regression model (Laerd Statistics, 2015).

A multiple-regression analysis was used to determine the model's overall fit or effectiveness to support the data or the coefficient of determination (R^2). The model must be a good fit for the data, report the coefficients (R^2), and predict the dependent variable based on the independent variables. The R^2 value is the proportion of variance in the dependent variable that is explained by the introduction of the independent variables over and above the mean model or the mean of the dependent variables (Laerd Statistics, 2015). The percentage is considered a small or large size effect, which measures the strength or linearity of the relationship between the variables numerically within the regression (Laerd Statistics, 2015). The models also report the *F*

statistic or obtained *F*-value that indicates the study is comparing an *F*-distribution (*F*-test), degrees of freedom (df), which is number of independent values that can vary in an analysis without breaking any constraints within the regression and residual df, and the significance of the regression model. The *F*-score is translated as $F\ (df_1,df_2) = 00.000$, *p* value (Salkind, 2017). The model summaries must have a large size effect and statistical significance to be considered a model that may predict a result.

School year 2014-2015 proficiency and revenue. The regression model comprised the district's student-proficiency data and revenue at the K-8 grade level. The model formula is as follows:

$$\text{Proficiency} = \beta_0 + \beta_1 ED_1 + \beta_2 SE_2 + \beta_3 G_3 + \beta_4 TR_4 + \beta_5 ST_5 + \varepsilon$$

Table 4.20 summarizes model fit when examining the regression formula. The information gained from the model table is the statistical significance of the result and the size of the effect. R^2 for the overall model was 70 percent, with an adjusted R^2 of 55 percent—a large size effect. Economically disadvantaged, special education, school type, gender, and total revenue predicted 2014-2015 EG3 proficiency [$F(7, 14) = 4.616$, $p < .007$].

Table 4.20

Model Summary for 2014-2015 EG3 Proficiency and Revenue

Model	R	R Square	Adjusted R Square	Standard Error of Estimate
1	.835[a]	.698	.547	4.29485

	Sum of Squares	df	Mean Square	F	Sig.
Regression	596.049	7	85.150	4.616	.007[b]
Residual	258.240	14	18.446		
Total	854.289	21			

a. Predictors: (Constant), 14-15 GF total revenue, district type, economically disadvantaged enrollment, special education enrollment, female, male
b. Dependent Variable: 14-15 EG3

As $p = .007$ satisfies $p < .05$, the result is statistically significant, i.e., the addition of all independent variables leads to a model that: (a) is significantly better at predicting the dependent variable than the means of the dependent variable; and (b) is significantly better fit to the data than the means of the dependent variable. However, the slope coefficient is $p > .05$ for most variables, indicating no linear relationship between those variables, with the exception of special-education students' statistically significant slope coefficient of $p < .05$. Specifically, the coefficient is statistically significant. Thus, a linear relationship exists with the number of special education students. Linearity refers to any change in an independent variable will produce a consequent change in the dependent variable (Salkind, 2017).

The R^2 for the overall model is 83 percent, with an adjusted R^2 of 74 percent for 2014-2015 MG3. The result indicates a large size effect. Table 4.21 provides the model summary and concludes that economically disadvantaged, special education, school type, gender, and total revenue predicted 2014-2015 MG3 proficiency [$F(7, 14) = 9.737$, $p < .000$].

Table 4.21

Model Summary for 2014-2015 MG3 Proficiency and Revenue

Model	R	R Square	Adjusted R Square	Standard Error of Estimate
	.911[a]	.830	.744	3.92781

	Sum of Squares	df	Mean Square	F	Sig.
Regression	1051.521	7	150.217	9.737	.000[b]
Residual	215.987	14	15.428		
Total	1267.508	21			

a. Predictors: (Constant), 14-15 GF total revenue, district type, economically disadvantaged enrollment, special education enrollment, female, male
b. Dependent Variable: 14-15 MG3

As $p = .000$ satisfies $p < .05$, the result is statistically significant. The slope coefficient is $p > .05$ for all variables, indicating no linear relationship between most variables, with the exception of special-education students' statistically significant slope coefficient of $p < .05$. Thus, a linear relationship exists with the number of special education students enrolled and proficiency.

The R^2 for the overall model is 86 percent, with an adjusted R^2 of 79 percent, indicating a large size effect for 2014-2015 EG5. Table 4.22 provides a model fit when examining the previous formula. Economically disadvantaged, special education, school type, gender, and total revenue predicted 2014-2015 EG5 proficiency [$F(7, 14) = 12.153$, $p < .000$].

Table 4.22

Model Summary 2014-2015 EG5 Proficiency and Revenue

Model	R	R Square	Adjusted R Square	Standard Error of Estimate
	.927[a]	.859	.788	4.56711

	Sum of Squares	df	Mean Square	F	Sig.
Regression	1774.499	7	253.500	12.153	.000[b]
Residual	292.019	14	20.859		
Total	2066.518	21			

a. Predictors: (Constant), 14-15 GF Total Revenue, District Type, economically disadvantaged enrollment, special education enrollment, female, male
b. Dependent Variable: 14-15 EG5

As $p = .000$ satisfies $p < .05$, the result is statistically significant. The model is better at predicting the dependent variable than the mean model and is a better fit to the data than the mean model. However, the slope coefficient is $p > .05$ for all variables, i.e., no linear relationship exists between most variables, with the exception of special-education students' statistically significant slope coefficient of $p < .05$. Thus, a linear relationship exists with the number of special education students enrolled and proficiency.

The R^2 for the overall model is 87 percent, with an adjusted R^2 of 80 percent. Thus, a large size effect exists. Economically disadvantaged, special education, school type, gender, and total revenue statistically significantly predicted 2014-2015 EG5 proficiency [$F(7, 14) = 12.908$, $p < .000$]. Table 4.23 provides model fit.

Table 4.23

Model Summary 2014-2015 MG5 Proficiency and Revenue

Model	R	R Square	Adjusted R Square	Standard Error of Estimate
	.931[a]	.866	.799	3.469

	Sum of Squares	df	Mean Square	F	Sig.
Regression	1087.495	7	155.356	12.908	.000[b]
Residual	168.505	14	12.036		
Total	1256.000	21			

a. Predictors: (Constant), 14-15 GF total revenue, district type, economically disadvantaged enrollment, special education enrollment, female, male
b. Dependent Variable: 14-15 MG5

As $p = .000$ satisfies $p < .05$, the result is statistically significant. The model is better at predicting the dependent variable. The model's slope coefficient is $p > .05$ for all variables. No linear relationship exists between variables, with the exception of special-education students' statistically significant slope coefficient of $p < .05$. Thus, a linear relationship exists with the number of special education students enrolled and proficiency..

School year 2015-2016 proficiency and revenue. The R^2 for the overall model is 84 percent, with an adjusted R^2 of 76 percent, indicating a large size effect. Table 4.24 provides the model summary. Economically disadvantaged, special education, school type, gender, and total revenue predicted 2015-2016 EG3 proficiency [$F(6, 14) = 12.466$, $p < .000$].

Table 4.24

Model Summary for 2015-2016 EG3 Proficiency and Revenue

Model	R	R Square	Adjusted R Square	Standard Error of Estimate
	.918[a]	.842	.775	3.77219

	Sum of Squares	df	Mean Square	F	Sig
Regression	1064.284	6	177.381	12.466	.000[b]
Residual	199.212	14	14.229		
Total	1263.496	20			

a. Predictors: (Constant), 15-16 GF total revenue, district type, economically disadvantaged enrollment, special education enrollment, female, male
b. Dependent Variable: 15-16 EG3

As p = .000 satisfies p < .05, the result is statistically significant. All the independent variables lead to a better model fit for predicting the dependent variable than the mean model. The slope coefficient is p > .05, indicating no linear relationship between variables, with the exception of special-education students' statistically significant slope coefficient of p < .05, indicating that the variable impacts the model. A linear relationship with the number of special education students enrolled and proficiency.

The R^2 for the overall model is 70 percent, with an adjusted R^2 of 57 percent, indicating a large size effect. Table 4.25 provides the model fit. Economically disadvantaged, special education, school type, gender, and total revenue predicted 2015-2016 MG3 proficiency [$F(6, 14) = 5.437$, $p < .004$].

Table 4.25

Model Summary for 2015-2016 MG3 Proficiency and Revenue

Model	R	R Square	Adjusted R Square	Standard Error of Estimate
	.836[a]	.700	.571	4.60929

	Sum of Squares	df	Mean Square	F	Sig.
Regression	693.036	6	115.506	5.437	.004[b]
Residual	297.438	14	21.246		
Total	990.474	20			

a. Predictors: (Constant), 15-16 GF total revenue, district type, economically disadvantaged enrollment, special education enrollment, female, male
b. Dependent Variable: 15-16 MG3

As p = .004 satisfies p < .05, the result is statistically significant. The slope coefficient is p > .05 for all variables, indicating no linear relationship between variables, with the exception of special-education students' statistically significant slope coefficient of p< .05. Thus, there is linearity between the number of special education students and proficiency.

The R^2 for the overall model is 75 percent, with an adjusted R^2 of 64 percent for a large size effect. Table 4.26 provides the model summary. Economically disadvantaged, special education, school type, gender, and total revenue predicted 2015-2016 EG5 proficiency [$F(6, 14) = 6.999$, $p < .001$].

Table 4.26

Model Summary for 2015-2016 EG5 Proficiency and Revenue

Model	R	R Square	Adjusted R Square	Standard Error of Estimate
	.866[a]	.750	.643	6.21962

	Sum of Squares	df	Mean Square	F	Sig.
Regression	1624.393	6	270.732	6.999	.001[b]
Residual	541.572	14	38.684		
Total	2165.964	20			

a. Predictors: (Constant), 15-16 GF total revenue, district type, economically disadvantaged enrollment, special education enrollment, female, male
b. Dependent Variable: 15-16 EG5

As $p = .001$ satisfies $p < .05$, a statistically significant result exists. However, the slope coefficient is $p > .05$, indicating no linear relationship between most variables, with the exception of special-education students' statistically significant slope coefficient of $p < .05$. Thus, a linear relationship exists in the population when examining proficiency.

The R^2 for the overall model is 68 percent, with an adjusted R^2 of 54 percent, indicating a large size effect. Table 4.27 provides a model summary. Economically disadvantaged, special education, school type, gender, and total revenue statistically significantly predicted 2015-2016 MG5 proficiency [$F(6, 14) = 4.935$, $p < .007$].

Table 4.27

Model Summary for 2015-2016 MG5 Proficiency and Revenue

Model	R	R Square	Adjusted R Square	Standard Error of Estimate
	.824[a]	.679	.541	3.50377

	Sum of Squares	df	Mean Square	F	Sig.
Regression	363.471	6	60.579	4.935	.007[b]
Residual	171.870	14	12.276		
Total	535.342	20			

a. Predictors: (Constant), 15-16 GF total revenue, district type, economically disadvantaged enrollment, special education enrollment, female, male
b. Dependent Variable: 15-16 MG5

As p = .007 satisfies p < .05, a statistically significant result exists. However, the slope coefficient is p > .05 for all variables, indicating no linear relationship between variables.

School year 2016-2017 proficiency and revenue. The R^2 for the overall model is 86 percent, with an adjusted R^2 of 82 percent, indicating a large size effect. Table 4.28 provides the model analysis. Economically disadvantaged, special education, school type, gender, and total revenue predicted 2016-2017 EG3 proficiency [F(6, 14) = 13.604, p < .000].

Table 4.28

Model Summary for 2016-2017 EG3 Proficiency and Revenue

Model	R	R Square	Adjusted R Square	Standard Error of Estimate
	.919[a]	.845	.783	3.87868

	Sum of Squares	df	Mean Square	F	Sig.
Regression	1227.975	6	204.663	13.604	.000[b]
Residual	225.663	15	15.044		
Total	1453.638	21			

a. Predictors: (Constant), 16-17 GF total revenue, district type, economically disadvantaged enrollment, special education enrollment, female, male
b. Dependent Variable: 16-17 EG3

As p = .000 satisfies p < .05, the result is statistically significant. The slope coefficient for all variables was p > .05, indicating no linear relationship between most variables, with the exception of special-education students' statistically significant slope coefficient of $p < .05$. Thus, a linear relationship exists in the special education population and proficiency.

The R^2 for the overall model is 67 percent, with an adjusted R^2 of 54 percent—a large size effect. Table 4.29 provides the model-summary fit for the formula. Economically disadvantaged, special education, school type, gender, and total revenue predicted 2016-2017 MG3 proficiency [F(6, 15) = 5.114, p < .005].

Table 4.29

Model Summary of 2016-2017 MG3 Proficiency and Revenue

Model	R	R Square	Adjusted R Square	Standard Error of Estimate
	.820[a]	.672	.540	4.7777

	Sum of Squares	df	Mean Square	F	Sig.
Regression	700.422	6	116.737	5.114	.005[b]
Residual	342.396	15	22.826		
Total	1042.818	21			

a. Predictors: (Constant), 16-17 GF total revenue, district type, economically disadvantaged enrollment, special education enrollment, female, male
b. Dependent Variable: 16-17 MG3

As p = .005 satisfies p < .05, the result is statistically significant. The model is a statistically significant, but the slope coefficient for most variables is p > .05, meaning no linear relationship exists between variables, with the exception of special education students, which satisfies $p < .05$. Thus, a linear relationship exists in the population.

The R^2 for the overall model is 76 percent, with an adjusted R^2 of 66 percent, indicating a large size effect. Table 4.30 provides the model summary. Economically disadvantaged, special education, school type, gender, and total revenue statistically significantly predicted 2016-2017 EG5 proficiency [F(6, 15) = 7.745, p < .001].

Table 4.30

Model Summary of 2016-2017 EG5 Proficiency and Revenue

Model	R	R Square	Adjusted R Square	Standard Error of Estimate	R Square Change
	.869[a]	.756	.658	5.2761	.756

	Sum of Squares	df	Mean Square	F	Sig.
Regression	1293.563	6	215.594	7.745	.001[b]
Residual	417.555	15	27.837		
Total	1711.119	21			

a. Predictors: (Constant), 16-17 GF total revenue, district type, economically disadvantaged enrollment, special education enrollment, female, male
b. Dependent Variable: 16-17 EG5

As p = .001 satisfies p < .05, the result is statistically significant. Overall, the model has greater statistical significance in predicting the dependent variable than the mean model. However, the slope coefficient is p > .05, indicating no linear relationship between most variables, with the exception of special-education students' statistically significant slope coefficient of $p < .05$. Thus, a linear relationship exists in the special education population and proficiency.

The R^2 for the overall model is 76 percent, with an adjusted R^2 of 66 percent— a large size effect. Table 4.31 provides the model summary. However, economically disadvantaged, special education, school type, gender, and total revenue did not significantly predict 2016-2017 MG5 proficiency [F(6, 15) = 1.219, p > .350].

Table 4.31

Model Summary for 2016-2017 *MG5 Proficiency and Revenue*

Model	R	R Square	Adjusted R Square	Standard Error of Estimate
	.573[a]	.328	.059	3.94850

	Sum of Squares	df	Mean Square	F	Sig.
Regression	114.033	6	19.006	1.219	.350[b]
Residual	233.860	15	15.591		
Total	347.893	21			

a. Predictors: (Constant), 16-17 GF total revenue, district type, economically disadvantaged enrollment, special education enrollment, female, male
b. Dependent Variable: 16-17 MG5

As p = .350 does not satisfy p < .05, the result is not statistically significant. The model is not better at predicting the dependent variable than the mean model. The slope coefficient is p > .05 for all variables, indicating no linear relationship between variables.

School year 2016-2017 growth and revenue. The regression model comprised district student proficiency data and revenue at the K-8 grade level. The model's formula is as follows:

$$\text{Growth} = \beta_0 + \beta_1 ED_1 + \beta_2 SE_2 + \beta_3 PT_3 + \beta_4 TR_4 + \beta_5 ST_5 + \varepsilon$$

The R^2 for the overall model was 56 percent, with an adjusted R^2 of 31 percent, indicating a smaller size effect. Table 4.32 provides model fit when examining the regression formula. Economically disadvantaged, special education, school type, gender, and total revenue did not significantly predict 2016-2017 EG5 growth [$F(5, 16) = 1.486$, $p > .249$].

Table 4.32

Model Summary of 2016-2017 EG5 Growth and Revenue

Model	R	R Square	Adjusted R Square	Standard Error of Estimate
	.563[a]	.317	.104	7.81604

	Sum of Squares	df	Mean Square	F	Sig.
Regression	453.916	5	90.783	1.486	.249[b]
Residual	977.447	16	61.090		
Total	1431.363	21			

a. Predictors: (Constant), 16-17 total GF revenue, district type, economic disadvantaged enrollment, special education enrollment, female, male
b. Dependent Variable: 16-17 SGEG5

As p = .249 does not satisfy p < .05, the result was not statistically significant. The model is not better at predicting a significant result. For all variables in the model, the slope coefficient is p > .05, indicating no linear relationship between variables.

The R^2 for the overall model is 30 percent, with an adjusted R^2 of .08 percent—a smaller size effect. Table 4.33 provides the model summary. Economically disadvantaged, special education, school type, gender, and total revenue did not significantly predict 2016-2017 MG5 growth [$F(5, 16) = 1.343$, $p > .297$].

Table 4.33

Model summary of 2016-2017 MG5 Growth and Revenue

Model	R	R Square	Adjusted R Square	Standard Error of Estimate
1	.544[a]	.296	.076	10.69733

	Sum of Squares	df	Mean Square	F	Sig.
Regression	768.459	5	153.692	1.343	.297[b]
Residual	1830.925	16	114.433		
Total	2599.384	21			

a. Predictors: (Constant), 16-17 total GF revenue, district type, economic disadvantaged enrollment, special education enrollment, female, male
b. Dependent Variable: 16-17 SGMG5

As p = .297 does not satisfy p < .05, the result is not statistically significant. The model is not a good fit in predicting a significant result. The slope coefficient is p > .05 for all variables, indicating no linear relationship between variables.

Research Question Four

Expenditures. The question asked whether differences existed when comparing the impact of charter and traditional public schools' total expenditures on student proficiency and growth. The independent variables used in the analysis include the number of economically disadvantaged students, number of special-education students, school type, gender, total revenue, and total expenditures. A multiple-regression analysis was used to determine the model's overall fit or the coefficient of determination (R^2). The value of R^2 is presented in the model summary tables for each regression model.

School year 2014-2015 proficiency and expenditures. The regression model comprised district student proficiency data at the K-8 grade level and expenditures. The formula for the model is as follows:

$$\text{Proficiency} = \beta_0 + \beta_1 ED_1 + \beta_2 SE_2 + \beta_3 G_3 + \beta_4 TE_4 + \beta_5 ST_5 + \varepsilon$$

The R^2 for the overall model is 70 percent, with an adjusted R^2 of 54 percent—a large size effect. Table 4.34 provides the model fit. Economically disadvantaged, special education, school type, gender, and total expenditures statistically significantly predicted 2014-2015 EG3 proficiency [$F(7, 14) = 4.584$, $p < .007$].

Table 4.34

Model Summary for 2014-2015 EG3 Proficiency and Expenditures

Model	R	R Square	Adjusted R Square	Standard Error of Estimate
	.834[a]	.696	.544	4.30544

	Sum of Squares	df	Mean Square	F	Sig.
Regression	594.773	7	84.968	4.584	.007[b]
Residual	259.516	14	18.537		
Total	854.289	21			

a. Predictors: (Constant), 14-15 total GF expenditures, district type, economic disadvantaged enrollment, special education enrollment, female, male
b. Dependent Variable: 14-15 EG3

As $p < .007$ satisfies $p < .05$, the result was statistically significant. This means that the addition of all independent variables leads to a model that is better at predicting the dependent variable and a better fit to the data than the mean model. The slope coefficient is $p > .05$ for all variables, indicating no linear relationship between most variables, with the exception of special education's statistically significant slope coefficient of $p < .05$. Thus, a linear relationship exists in the special education population and proficiency.

The R^2 for the overall model is 83 percent, with an adjusted R^2 of 75 percent—a large size effect. Table 4.35 provides the model fit. Economically disadvantaged, special education, school type, gender, and total revenue predicted 2014-2015 MG3 proficiency [$F(7, 14) = 9.756$, $p < .000$].

Table 4.35

Model Summary for 2014-2015 MG3 Proficiency and Expenditures

Model	R	R Square	Adjusted R Square	Standard Error of Estimate
	.911[a]	.830	.745	3.92468

	Sum of Squares	df	Mean Square	F	Sig.
Regression	1051.864	7	150.266	9.756	.000[b]
Residual	215.644	14	15.403		
Total	1267.508	21			

a. Predictors: (Constant), 14-15 total GF expenditures, district type, economic disadvantaged enrollment, special education enrollment, female, male
b. Dependent Variable: 14-15 MG3

As $p = .000$ satisfies $p < .05$, the result is statistically significant. For most variables, the slope coefficient is $p > .05$, except with special-education students' statistically significant slope coefficient of $p < .05$. Thus, a linear relationship exists in the population.

The R^2 for the overall model is 86 percent, with an adjusted R^2 of 79 percent, indicating a large size effect. Table 4.36 provides the model summary. Economically disadvantaged, special education, school type, gender, and total revenue predicted 2014-2015 EG5 proficiency [$F(7, 14) = 12.137$, $p < .000$].

Table 4.36

Model Summary for 2014-2015 EG5 Proficiency and Expenditures

Model	R	R Square	Adjusted R Square	Standard Error of Estimate
	.927[a]	.859	.788	4.56982

	Sum of Squares	df	Mean Square	F	Sig.
Regression	1774.151	7	253.450	12.137	.000[b]
Residual	292.366	14	20.883		
Total	2066.518	21			

a. Predictors: (Constant), 14-15 total GF expenditures, district type, economic disadvantaged enrollment, special education enrollment, female, male
b. Dependent Variable: 14-15 EG5

As $p = .000$ satisfies $p < .05$, the result is statistically significant. The model is better at predicting the dependent variable. The slope coefficient for most variables is $p > .05$. No linear relationship exists between variables, with the exception of special-education students' statistically significant slope coefficient of $p < .05$. Thus, a linear relationship exists in the population.

The R^2 for the overall model is 87 percent, with an adjusted R^2 of 80 percent—a large size effect. Table 4.37 provides a model summary. Economically disadvantaged, special education, school type, gender, and total revenue statistically significantly predicted 2014-2015 MG5 proficiency [$F(7, 14) = 12.975$, $p < .000$].

Table 4.37

Model Summary of 2014-2015 *MG5 Proficiency and Expenditures*

Model	R	R Square	Adjusted R Square	Standard Error of Estimate
	.931[a]	.866	.800	3.461

	Sum of Squares	df	Mean Square	F	Sig.
Regression	1088.255	7	155.465	12.975	.000[b]
Residual	167.745	14	11.982		
Total	1256.000	21			

a. Predictors: (Constant), 14-15 total GF expenditures, district type, economic disadvantaged enrollment, special education enrollment, female, male
b. Dependent Variable: 14-15 MG5

As $p = .000$ satisfies $p < .05$, the result is statistically significant. The model is a statistically significant better fit. No linear relationship exists between most variables, with a slope coefficient of $p > .05$. However, the special-education slope coefficient is statistically significant, at $p < .05$. Thus, a linear relationship exists in the population.

School year 2015-2016 proficiency and expenditures. The R^2 for the overall model was 84 percent, with an adjusted R^2 of 77 percent, a large size effect. Table 4.38 provides the model summary. Economically disadvantaged, special education, school type, gender, and total revenue predicted 2015-2016 EG3 proficiency [$F(6, 14) = 12.348$, $p < .000$].

Table 4.38

Model summary for 2015-2016 EG3 Proficiency and Expenditures

Model	R	R Square	Adjusted R Square	Standard Error of Estimate
	.917[a]	.841	.773	3.78724

	Sum of Squares	df	Mean Square	F	Sig.
Regression	1062.691	6	177.115	12.348	.000[b]
Residual	200.805	14	14.343		
Total	1263.496	20			

a. Predictors: (Constant), 15-16 total GF expenditures, district type, economic disadvantaged enrollment, special education enrollment, female, male
b. Dependent Variable: 15-16 EG3

As $p = .000$ satisfies $p < .05$, the result is statistically significant. No linear relationship exists between most variables, as the slope coefficient is $p > .05$ for all variables, with the exception of special-education students' statistically significant slope coefficient of $p < .05$. Thus, a linear relationship exists in the population.

The R^2 for the overall model is 70 percent, with an adjusted R^2 of 57 percent—a large size effect. Table 4.39 provides model fit. Economically disadvantaged, special education, school type, gender, and total expenditures predicted MG3 proficiency [$F(6, 14) = 5.446$, $p < .004$].

Table 4.39

Model Summary for 2015-2016 MG3 Proficiency and Expenditures

R	R Square	Adjusted R Square	Standard Error of Estimate	R Square Change
.837[a]	.700	.572	4.60647	.700

	Sum of Squares	df	Mean Square	F	Sig.
Regression	693.400	6	115.567	5.446	.004[b]
Residual	297.074	14	21.220		
Total	990.474	20			

a. Predictors: (Constant), 15-16 total GF expenditures, district type, economic disadvantaged enrollment, special education enrollment, female, male
b. Dependent Variable: 14-15 MG3

As $p = .004$ satisfies $p < .05$, the result is statistically significant, and the model is a better fit to the data than the mean model. The slope coefficient for most variables is $p > .05$. No linear relationship exists between variables, with the exception of special-education students' statistically significant slope coefficient of $p < .05$. Thus, a linear relationship exists in the population.

The R^2 for the overall model is 75 percent, with an adjusted R^2 of 64 percent, a large size effect. Table 4.40 provides the regression-model results. Economically disadvantaged, special education, school type, gender, and total expenditures predicted 2015-2016 EG5 proficiency [$F(6, 14) = 6.965$, $p < .001$].

Table 4.40

Model Summary for 2015-2016 EG5 Proficiency and Expenditures

Model	R	R Square	Adjusted R Square	Standard Error of Estimate
	.865[a]	.749	.642	6.23088

	Sum of Squares	df	Mean Square	F	Sig.
Regression	1622.430	6	270.405	6.965	.001[b]
Residual	543.535	14	38.824		
Total	2165.964	20			

a. Predictors: (Constant), 15-16 total GF expenditures, district type, economic disadvantaged enrollment, special education enrollment, female, male
b. Dependent Variable: 15-16 EG5

As $p = .001$ satisfies $p < .05$, the result is statistically significant, and the model is better at predicting the dependent variable than the mean model. The slope coefficient for all the variables is $p > .05$, with no linear relationship between most variables, with the exception of special-education students' statistically significant slope coefficient of $p < .05$. Thus, a linear relationship exists in the population.

The R^2 for the overall model is 68 percent, with an adjusted R^2 of 54 percent, a large size effect. Table 4.41 provides the model summary. Economically disadvantaged, special education, school type, gender, and total expenditures predicted 2015-2016 MG5 proficiency [$F(6, 14) = 4.926$, $p < .007$].

Table 4.41

Model Summary for 2015-2016 MG5 Proficiency and Expenditures

Model	R	R Square	Adjusted R Square	Standard Error of Estimate	R Square Change
	.824[a]	.679	.541	3.50592	.679

	Sum of Squares	df	Mean Square	F	Sig.
Regression	363.261	6	60.543	4.926	.007[b]
Residual	172.081	14	12.291		
Total	535.342	20			

a. Predictors: (Constant), 15-16 total GF expenditures, district type, economic disadvantaged enrollment, special education enrollment, female, male
b. Dependent Variable: 15-16 MG5

As $p = .007$ satisfies $p < .05$, the result is statistically significant. All the independent variables lead to a model that predicts the dependent variable better than the mean model. The slope coefficient for most variables is $p > .05$, which means no linear relationship exists between variables, with the exception of special-education students' statistically significant slope coefficient of $p < .05$. Thus, a linear relationship exists in the population.

School year 2016-2017 proficiency and expenditures. The R^2 for the overall model is 85 percent, with an adjusted R^2 of 78 percent—a large size effect. Table 4.42 provides the model summary. Economically disadvantaged, special education, school type, gender, and total expenditures predicted 2016-2017 EG3 proficiency [$F(6, 15) = 13.692$, $p < .000$].

Table 4.42

Model Summary for 2015-2016 EG3 Proficiency and Expenditures

Model	R	R Square	Adjusted R Square	Standard Error of Estimate
	.920[a]	.846	.784	3.86814

	Sum of Squares	df	Mean Square	F	Sig.
Regression	1229.200	6	204.867	13.692	.000[b]
Residual	224.437	15	14.962		
Total	1453.638	21			

a. Predictors: (Constant), 15-16 total GF expenditures, district type, economic disadvantaged enrollment, special education enrollment, female, male
b. Dependent Variable: 15-16 EG3

As $p = .000$ satisfies $p < .05$, the result is statistically significant. The slope coefficient for most variables is $p > .05$, except special-education students' statistically significant slope coefficient of $p < .05$. Thus, a linear relationship exists in the population.

The R^2 for the overall model is 67 percent, with an adjusted R^2 of 54 percent—a large size effect. Table 4.43 provides the regression's model summary. Economically disadvantaged, special education, school type, gender, and total expenditures statistically significantly predicted 2015-2016 MG3's proficiency [$F(6, 15) = 5.109$, $p < .005$].

Table 4.43

Model Summary for 2015-2016 MG3 Proficiency and Expenditures

Model	R	R Square	Adjusted R Square	Standard Error of Estimate
	.819[a]	.671	.540	4.7792

	Sum of Squares	df	Mean Square	F	Sig.
Regression	700.207	6	116.701	5.109	.005[b]
Residual	342.611	15	22.841		
Total	1042.818	21			

a. Predictors: (Constant), 15-16 total GF expenditures, district type, economic disadvantaged enrollment, special education enrollment, female, male
b. Dependent Variable: 15-16 MG3

As $p = .005$ satisfies $p < .05$, the result is statistically significant, but the slope coefficient for most variables is $p > .05$, with the exception of special-education students' statistically significant slope coefficient of $p < .05$, indicating a linear relationship in the population.

Table 4.44 provides the model summary. The R^2 for the overall model is 76 percent, with an adjusted R^2 of 66 percent—a large size effect. Economically disadvantaged, special education, school type, gender, and total expenditures statistically significantly predicted 2015-2016 EG5 proficiency [$F(6, 15) = 7.687$, $p < .001$].

Table 4.44

Model Summary of 2015-2016 EG5 Proficiency and Expenditures

Model	R	R Square	Adjusted R Square	Standard Error of Estimate
	.869[a]	.755	.656	5.2911

	Sum of Squares	df	Mean Square	F	Sig.
Regression	1291.190	6	215.198	7.687	.001[b]
Residual	419.929	15	27.995		
Total	1711.119	21			

a. Predictors: (Constant), 15-16 total GF expenditures, district type, economic disadvantaged enrollment, special education enrollment, female, male
b. Dependent Variable: 15-16 EG5

As p = .001 satisfies p < .05, so there is a statistically significant result. The slope coefficient for most variables is $p > .05$. A linear relationship exists with special education, with a statistically significant slope coefficient of $p < .05$.

The R^2 for the overall model is 34 percent, with an adjusted R^2 of 60 percent—a smaller size effect. Table 4.45 provides the model summary. Economically disadvantaged, special education, school type, gender, and total expenditures statistically significantly predicted 2015-2016 MG5 proficiency [F(6, 15) = 1.220, p > .350].

Table 4.45

Model Summary for 2015-2016 MG5 Proficiency and Expenditures

Model	R	R Square	Adjusted R Square	Standard Error of Estimate
1	.573[a]	.328	.059	3.94799

	Sum of Squares	df	Mean Square	F	Sig.
Regression	114.094	6	19.016	1.220	.350[b]
Residual	233.799	15	15.587		
Total	347.893	21			

a. Predictors: (Constant), 15-16 total GF expenditures, district type, economic disadvantaged enrollment, special education enrollment, female, male
b. Dependent Variable: 15-16 MG5

As p = .350 does not satisfy p < .05, the result is not statistically significant. The slope coefficient is p > .05 for all variables, indicating no linear relationship exists between variables.

School year 2016-2017 growth and expenditures. The regression model consisted of district student proficiency data at the K-8 grade level and expenditures. The formula for the model is as follows:

$$\text{Growth} = \beta_0 + \beta_1 ED_1 + \beta_2 SE_2 + \beta_3 G_3 + \beta_4 TE_4 + \beta_5 ST_5 + \varepsilon$$

The R^2 for the overall model is 32 percent, with an adjusted R^2 of 10 percent, a small size effect. Table 4.46 provides the model summary. Economically disadvantaged, special education, school type, gender, and total expenditures did not significantly predict 2016-2017 EG5 growth [$F(7, 14) = 1.468$, $p < .254$].

Table 4.46

Model Summary of 2016-2017 EG5 Growth and Expenditures

Model	R	R Square	Adjusted R Square	Standard Error of Estimate
	.561[a]	.315	.100	7.83095

	Sum of Squares	df	Mean Square	F	Sig.
Regression	450.182	5	90.036	1.468	.254[b]
Residual	981.181	16	61.324		
Total	1431.363	21			

a. Predictors: (Constant), 16-17 total GF expenditures, district type, economic disadvantaged enrollment, special education enrollment, female, male
b. Dependent Variable: 16-17 SGEG5

As p = .254 does not satisfy p < .05, the result is not statistically significant. The slope coefficient is p > .05 for all variables, so no linear relationship exists between variables.

The R^2 for the overall model is 30 percent, with an adjusted R^2 of 8 percent, a small size. Table 4.47 provides the model summary. Economically disadvantaged, special education, school type, gender, and total expenditures did not significantly predict MG5 growth [$F(5, 16) = 1.352$, $p > .294$].

Table 4.47

Model Summary of 2016-2017 MG5 Growth and Expenditures

Model	R	R Square	Adjusted R Square	Standard Error of Estimate
	.545[a]	.297	.077	10.68735

	Sum of Squares	df	Mean Square	F	Sig.
Regression	771.874	5	154.375	1.352	.294[b]
Residual	1827.510	16	114.219		
Total	2599.384	21			

a. Predictors: (Constant), 16-17 total GF expenditures, district type, economic disadvantaged enrollment, special education enrollment, female, male
b. Dependent Variable: 16-17 SGMG5

As $p = .294$ does not satisfy $p < .05$, the result is not statistically significant. The slope coefficient is $p > .05$ for all variables, so no linear relationship exists between variables.

Research Question Five

The question focused on comparing the two school types, charter and traditional public schools, to determine which produces the greater return on investment. In this study, 37 traditional public schools and 28 charter public schools at the K-8 grade level were examined. An independent sample t-test and multiple-regression analysis results were run to determine whether differences existed between charter and traditional school students. The dataset analysis was at the district level for school years 2014-2017.

In comparing charter and traditional public schools' overall funding and expenditures, no statistically significant spending differences were found. Table 4.48 presents the outcome for each fiscal year and each district type. During the 2014-2015 fiscal year, the return on investment for traditional public schools was minus-seven percent, compared with a zero percent return for charter public schools. During the 2015-2016 fiscal year, the return on investment for

traditional public schools was minus-five percent, compared with a zero percent return for charter public schools when using the mean of all charter public schools. During the 2016-2017 fiscal year, the return on investment for traditional public schools was 13 percent, compared with a zero percent return for charter public schools when using the mean of all charter public schools. In fiscal years 2014-2016, traditional public schools were in the red (negative), but emerged in the black (positive) during fiscal year 2016-2017. The charter public schools were in the black for fiscal years 2014-2016, but in the red during the 2016-2017 fiscal year. The average return over these three years was one percent for traditional public schools and zero for charter public schools. No statistically significant differences in spending practices between the two district types were found.

Table 4.48

Revenue and Expenditure Analysis of Charter and Traditional Public School Districts (2014-2017)

District Type	2014-15 Fiscal Year	2015-16 Fiscal Year	2016-17 Fiscal Year	Average Yearly Return
Traditional	($46,471,611)	($35,655,338)	$78,690,968	($1,145,327)
Charter	$165,118	$107,507	($737,090)	($154,822)
	Percent	Percent	Percent	Percent Average Return
Traditional	-7	-5	13	0.67
Charter	0.10	0.07	-0.37	-0.07

Traditional – Traditional Public Schools
Charter - Charter Public Schools

The expenditure categories of instruction, instructional staff support, administration, operations and maintenance, and total support services were examined to determine any differences in the spending patterns for each area. Table 4.49 provides a comparison of the

percentage of funding for each available expenditure area. Traditional public schools expended slightly more funds, at an average of 46 percent toward instruction compared to 42 percent for charter public schools. Traditional public schools expended funds at a higher average of 17 percent for instructional staff support compared to an average of nine percent for charter public schools. Traditional public schools expended less, with an average of 14 percent for administration compared to 21 percent for charter public schools. Traditional public schools expended slightly less, with an average of 12 percent earmarked for operations and maintenance compared to 16 percent for charter public schools. Traditional public schools allocated an average of 47 percent toward total support services compared to 48 percent for charter public schools.

Table 4.49

Percentage of Funding Allocated for Each Expenditure Area (2014-2017)

District Type	Expenditure	2014-2015 Percent Expenditure	2015-2016 Percent Expenditure	2016-2017 Percent Expenditure	Average Percentage
Traditional	Instruction	50	44	45	46
Charter		44	43	38	42
Traditional	Instructional Staff Support	17	18	14	17
Charter		9	10	9	9
Traditional	Administration	14	16	11	14
Charter		21	22	19	21
Traditional	Operations and Maintenance	12	12	12	12
Charter		19	16	13	16
Traditional	Total Support Services	48	51	42	47
Charter		49	50	44	48

Traditional – Traditional Public Schools
Charter - Charter Public Schools

Chapter 5: Discussion

Introduction

Marketplace competition, introduced by Michigan legislation through Proposal A in 1994, aimed to improve education equity, student performance, and public-school resource-allocation practices while providing a return on investment (Henig, Moser, Holyoke, & Lacireno-Paquet, 1999; Pan, Rudo, Schneider, & Smith-Hansen, 2003; Mendez, 2004; Binelli, 2017). Some states claim that charter public schools have impacted funding for traditional public schools in urban contexts adversely, as they are competing for funds that impact recruitment of teachers and staff, as well as maintenance of current operations (Loeb & Cullen, 2004; Waslander, Pater, & Van der Weide, 2010; Augenblick, Palaich, & Associates, 2016). This study sought to identify whether the differences between charter and traditional public schools, with the introduction of marketplace competition, contribute to producing better student performance outcomes.

This study built on studies by Pan, Rudo, Schneider, and Smith-Hansen (2003); Gronberg, Jansen, Taylor, and Booker (2005); Murray (2011); Gronberg, Jansen, and Taylor (2012); Bettinger (2005); CREDO (2013); and the University of Michigan (2016), which compared charter and traditional public schools through variables such as number of economically disadvantaged students, number of chronically absent students, attrition rates, race, gender, graduation rates, school location, years of operation, grade level, and overall student performance measured as both growth and proficiency (Gronberg, Jansen, Taylor & Booker, 2005); Gronberg, Jansen & Taylor, 2012); Bettinger, 2005; CREDO, 2013; University of Michigan, 2016). Charter and traditional public schools have been compared comprehensively over the past two decades with an emphasis on student performance compared to variance in

overall variables' impact. However, this study examined resource allocation using total revenue and expenditures, and student performance using growth and proficiency.

Focusing on resource allocation and its impact on student performance was the foundation for this research. Additionally, this exploratory study sought to examine how other factors—such as the K–8 school model, the over 90 percent African American enrollment in the urban community studied, similar enrollment sizes, volume of highly economically disadvantaged students, volume of special-education students, and student-teacher ratio—help predict student performance and determine return on investment. Because charter public schools were introduced as an alternative to the traditional public school approach, which was perceived as not producing successful outcomes for underserved children, this study compared charter and traditional public districts by examining whether differences exist in spending practices to determine which model is producing better student-performance outcomes. A descriptive statistical analysis, an independent t-test of means, and multiple-regression analysis were used to determine the significance of the differences in charter and traditional public schools' spending practices and student performance.

Data collected were solely quantitative, using various Michigan public databases from the Center for Educational Performance and Information (CEPI), Michigan Student Data System (MSDS), Financial Information Database (FID), and Educational Entity Master (EEM). These databases contain all district data relevant to the study. M-STEP data from grades three and five were collected to determine any differences in proficiency (2014-2017) and growth (2016-2017) among math and English language arts students. The sample included 60 public schools: 28 charter public schools and 37 traditional public schools ranging from grades K–8.

The following research questions guided the study:

(6) Comparing charter and traditional public schools, does a difference exist in student proficiency?

(7) Comparing charter and traditional public schools, does a difference exist in student growth?

(8) Comparing charter and traditional public schools, does a difference exist in total-revenue's impact on student proficiency and growth?

(9) Comparing charter and traditional public schools, does a difference exist in total expenditures' impact on student proficiency and growth?

(10) Comparing charter and traditional public schools, does a difference exist in return on investment?

Summary of Findings

This study examined whether charter public schools' resource-allocation practices are improving students' performance and whether any improvements have been accomplished by using the same or fewer resources, compared with traditional public schools. Analyzing a large urban center provided this study with the data to investigate the differences between charter and traditional public schools by comparing student proficiency, student growth, impact from total revenue on student proficiency and growth, impact from total expenditures on student proficiency and growth, and return on investment. The secondary purpose examined whether spending practices promoted different student-performance outcomes. The hypotheses for this exploratory study were non-directional to determine whether differences between charter and traditional public schools existed in student performance and resource allocation.

Comparing charter and traditional public school student proficiency using an independent-samples t-test, this study found that the results indicated a statistically significant difference in charter public schools' performance when compared with traditional public schools in students' English language arts and math proficiency during the 2014-2017 school years, thereby validating the alternative hypothesis, i.e., that a difference exists when comparing charter and traditional public schools' student proficiency. The results indicated that charter public schools perform better than traditional public schools when examining only the means of the student's performance levels (*Proficient* and *Not Proficient*) for the 2014-2017 school years. Charter public school performance is greater in English language arts when compared with mathematics proficiency. A trend worth noting is that both charter and traditional public schools' proficiency rates for math decreased in fifth grade during the 2014-2017 school years. The result is consistent with the latest NAEP (2015) results, which found that average math proficiency for fourth- through eighth-graders decreased in higher grade levels but more pronounced for fifth, sixth, and seventh grade levels in urban centers (U.S. Department of Education, n.d.; Nation's Report Card, 2015; DeSilver, 2017).

While the means were higher in third- and fifth-grade mathematics for charter public schools during the 2014-2017 school years, the result was not significant when compared to traditional public schools. Overall, Michigan's math pass rates on the Michigan Student Test of Educational Progress (M-STEP) declined in third, fifth, seventh, and eighth grades (Chambers, 2018). While NAEP (2015) averages were only 31 percent proficiency in math, the M-STEP showed math proficiency at 45.7 percent in third grade and 32.7 percent in eighth grade (Nation's Report Card, 2015; Chambers, 2018). The trend presents the decline in math scores

for Michigan students, which is present in this study. Therefore, charter and traditional public schools share similar mathematics results in urban centers.

This study correspondingly compared charter and traditional public schools to determine whether a difference in student growth existed using an independent-samples t-test. The results indicated a statistically significant difference for the 2016-2017 school year. The Michigan Department of Education only could provide one year's worth of growth data. Charter public schools performed better than traditional public schools in English language arts, but both charter and traditional public schools performed low in math. The finding that both school models performing low is consistent with the Nation's Report Card (2015) findings of declines in math performance.

Lastly, this study compared charter and traditional public schools to determine which produces the greater return on investment. In the comparison, no statistically significant overall expenditure differences existed between the school models. Factoring the resource allocation from school years 2014 through 2017, the average return was slightly higher for traditional public schools. Overall, traditional public schools resource allocation outcome through the three years was one percent and zero for charter public schools. Operationally, there are similarities between charter and traditional public schools, which is consistent with the University of Michigan (2016) findings that urban charter and traditional public schools are operationally similar due to the similar challenges.

Examining the specific allocation categories of instruction, instructional staff support, administration, operations and maintenance, and total support services were different in two areas: instructional support and administration. Charter public schools allocated greater funds to administration and traditional schools provided greater funds to instructional support. The

findings were not statistically significant as the overall resource allocation outcome was similar between charter and traditional public schools. The remainder of the allocation categories were narrowly different.

Implications of the Study

This study contributes to overall charter and traditional public school research through its method of using resource allocation and overall population variables to compare charter and traditional public schools in Michigan. Specifically, this study adds context to marketplace-competition efficacy introduced through Proposal A. Typically, policies are evaluated to determine their impact on society or success in implementation (Fowler, 2013). The following context outlines the importance of the knowledge gained from this study.

This study evaluated the marketplace-competition policy enacted through Proposal A to improve student performance among underserved students in Michigan. More specifically, urban area studied is comprised of mostly historically low-performing African American students, making its long-underserved population a proper landscape in which to examine policy impact (National Center for Education Statistics, 1996; U.S. Department of Education, 1996; Kids Count in Michigan Data Book, 2018). The implications of this study's results demonstrate the policy has been ineffective in creating high-quality schools that improve the educational opportunities for African American students. The policy has created more of the same school model. Specifically, charter and traditional public schools are more of the same when comparing the return on investment and operations. The outcome is consistent with the Bettinger (2005) and the University of Michigan (2016) studies. The outcome of this study confirms that marketplace competition is an insufficient business model when used within the urban public school

education space. The results of this study indicated that charter public schools are not more efficient systematically than traditional public schools (Gronberg, Jansen & Taylor, 2012).

A popular anecdotal characteristic of charter public schools in Michigan is the ability to provide equity to educationally disadvantaged or underserved populations of students (Lacireno-Paquet, Holyoke, Moser, & Henig, 2002). For Michigan's historically low performing population of students, African Americans, the equity is not meaningfully better when compared to those of traditional public schools. One aspect of this study capturing the equity outcome of Proposal A is with the discrepancies of special education populations of charter public schools compared to traditional public schools. This study provides context for the enrollment population of students.

Anecdotally, a general criticism of charter public schools in Michigan has been with the enrollment of special education students. Charter public schools have access to lower-cost resources and traditional public schools serve a wider group of students at greater costs (Lacireno-Paquet, Holyoke, Moser, & Henig, 2002). Special education alone boosts education costs for traditional public schools, which causes a greater strain on the overall budget (Gronberg, Jansen & Taylor, 2012). Charter and traditional public schools are operationally similar; therefore, the equity is not significantly better. This study provides the context for how the number of special education students has an adverse impact on student proficiency and growth. While charter public schools are performing better than traditional public, this study provides two very important points. Charter public school students are nevertheless underachieving even with higher score levels on the M-STEP than traditional public school students, and the wider range of populations traditional public schools have adversely impacts student performance.

Currently, state public school funding and allocation practices have not been successful overwhelmingly in a large urban center. The introduction of Proposal A in Michigan intended to equalize funding. The policy has placed a greater strain on both charter and traditional public schools (Augenblick, Palaich, & Associates Inc., 2016; CATO, 2018). The resources are not plentiful in poor urban areas due to the shifting of resources. Marketplace competition has shifted funds away from traditional public schools, but has also placed a strain on other charter public schools in the area due to the competition for children (CATO, 2018). Charter public schools were perceived to produce greater outcomes with fewer resources (CATO, 2018).

However, it is important to know whether the outcomes derive from similar student populations, which this study clearly shows a difference in student populations. Since the inception of Proposal A or marketplace competition, student performance in this study's urban context has not improved. The outcome is apparent especially when examining the school-policy changes dating back to the last school-funding structure revamp in the 1990s, and the fact that resource-allocation practices between charter and traditional public schools are similar (National Center for Education Statistics, 2013; Nation's Report, 2015; Education Trust-Midwest, 2018; Higgins, 2015; Lewis, 2015). Overall, charter public schools perform better than traditional public schools on the M-STEP, but both are stagnant in student achievement and perform poorly.

Limitations

This study was unable to use various levels of data—including building-level financial information, growth data, teacher and administrative data (attendance, years of service, and certification areas), and truancy, which would have added more context. In addition, for the Michigan Department of Education's (MDE), Top 10 in 10, the plan perceivably compares *Proficient* and *Not Proficient*. This limits the capacity to conduct a holistic comparison. The

MDE currently is projecting that further data soon will be available that will include teacher- and school-administrator education, attendance, years of employment, and educator certification.

This study was conducted at the district level but not the school level. A school-level examination would provide for a deeper analysis of charter and traditional public-school spending practices' impact on student performance. Data agreements were not secured from all 60 schools examined in the present study.

Finally, the study focused on a specific population within a specific urban center. Generalizability would not apply due to the small population used for analysis.

Future Research

Future research could focus on deeper analysis of charter and traditional public-school spending practices' impact on student performance at the school level of analysis. Such analysis could include multiple variables providing greater knowledge of charter and traditional public school systems. The rationale for more variables is for a greater understanding of the school as a fluctuating organization. This study provided a baseline for a directional study.

Currently, school-level financial data are not publicly available through the Michigan Department of Education, but can be collected via negotiations with local school districts. Such deeper research is obtained by collecting financial and other data at the school level to compare similar schools. Collecting such data is possible with appropriate agreements in place to protect student-level data privacy.

Such additional research can compare charter and traditional public schools as well as examine salient variables within a school that may influence student achievement or predict student performance based on multiple independent variables in various locations with similar demographics. These school-level variables are, but not limited to, finances, number of special-

education students, number of English-language learners, number of economically disadvantaged students, staffing (years of employment), educator qualifications, truancy, after-school and instructional support programs, achievement-gap percentages, and teacher evaluations.

This study examines district-level resource allocation and student performance. A more in-depth examination of population specifics can expose more influences or relationships within resource allocation and student performance when comparing charter and traditional public schools. Future studies also should compare special-education students' performance between charter and traditional public schools, as well as charter and traditional public schools' funding structures, to help determine student-performance outcomes. Using multiple independent variables from schools to create a complete picture would aid in understanding the impact of these variables on student performance. A multiple-regression analysis could determine the variance and relative input of each variable on the dependent variables.

Conclusion

Urban children are more than twice as likely to be living in poverty and receive free and reduced-price lunches (U.S. Department of Education, 2016). While the schools examined in this study are all located in a particular urban context, the population demographics are similar in terms of race and socioeconomic status, except special education, which exerted an inherent effect on student performance. This study discovered a common trend between charter and traditional public schools in special education. The data indicate that special education is a statistically significant factor in the relationship between charter and traditional public school student performance. Traditional public schools enrolled nine percent more special-education students during the 2014-2017 school years, and special education predicted student-performance outcomes when comparing charter and traditional public schools. The finding

corroborates Zimmer et al.'s (2012) results, which indicated that researchers must be more explicit when designing studies to compare charter and traditional public schools to ensure a better understanding and representation, compared to only examining student mean performance. Traditional public schools' special-education populations are larger and adversely affected these schools' revenue, expenditures, and student performance.

This study verified that charter public schools' overall performance is better than that of traditional public schools. Nevertheless, the population must be considered when making the comparison. These findings match Gronberg, Jansen, and Taylor's (2012) explanation for the difference in that charter public schools have smaller overall student populations than traditional public schools, which serve a wider group of students, including special education, early childhood, and non-native English-language learners, boosting education costs. No statistically significant results could be found between resource allocation and student performance by comparing charter and traditional public schools.

This study demonstrates differences not only between charter and traditional public schools in the special-education population, but also between administrative and instruction resource allocations. Charter public schools spent more on administrative costs and less on instruction, while traditional public schools spent more on instruction and less on administrative costs. However, traditional public schools' overall efficiency in resource allocation was one percent better.

Charter public schools have become competitive through the perception that they can operate with fewer resources to obtain better results, thereby achieving better outcomes at a lower cost than traditional public schools. However, extant studies clearly show that results vary depending on the context, such as funding challenges and populations served (Booker, Gilpatric,

Gronberg, & Jansen, 2008; CATO, 2018). M-STEP scores are higher for charter public schools, but resource-allocation efficiency is less effective than that of traditional public schools during the 2014-2017 school years.

Charter and traditional public schools are legislatively different in Michigan, but no statistically significant differences were found when comparing resource allocation from a return-on-investment perspective. The outcome is similar to the University of Michigan (2016) study, which found that charter and traditional public schools are similar resource-allocation operations. This lack of operational differences can explain this study's similar financial-practices outcome findings, as well as findings from Pan, Rudo, Schneider, and Smith-Hansen (2003). With similar practices, student outcomes were persistently poor for both charter and traditional public schools. Thus, the marketplace competition introduced has not improved public education for historically low-achieving students in Michigan. The more prevalent finding is that the student populations between charter and traditional public schools are different due to special-education student populations, which result in better performance for charter public schools. Resource-allocation practices are different in the way funds are expended, but overall resource-allocation outcomes are comparable across charter and traditional public schools.

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Appendices

Appendix A

UNIVERSITY OF MICHIGAN
eResearch.umich.edu
Flint Institutional Review Board • 530 French Hall, 303 E. Kearsley St, Flint, MI 48502 • phone (810) 762-3383 • fax (313) 593-0526 • research@umflint.edu

To: Rajah Smart

From: Kazuko Hiramatsu

Cc: Rajah Smart

Mary Jo Finney

Subject: Notice of Determination of "Not Regulated" Status for [HUM00157277]

SUBMISSION INFORMATION:

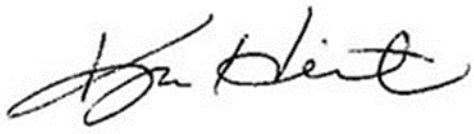
Title: Comparing Resource-Allocation Practices on Student Performance
Full Study Title (if applicable): Comparing Resource-Allocation Practices on Student Performance Between Charter Public Schools and Traditional Public Schools
Study eResearch ID: HUM00157277
Date of this Notification from IRB: 1/21/2019
Date of IRB Not Regulated Determination: 1/21/2019

IRB NOT REGULATED STATUS:

Category Outcome Letter Text

Research Using Publicly Available Data Sets

Based on the information provided, the proposed study falls under the University of Michigan's policy for research using publicly available data sets (http://hrpp.umich.edu/initiative/datasets.html). Under this policy and in accordance with federal regulations for human subjects research (45 CFR Part 46) IRB approval is not required as the data cannot be tracked to a human subjects.



Kazuko Hiramatsu
Chair, IRB Flint