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The Corridor of Shame: An Immersed Analysis of South Carolina Schools

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THE CORRIDOR OF SHAME: AN IMMERSED ANALYSIS OF SOUTH CAROLINA SCHOOLS

By

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ABSTRACT

This research project discusses school funding instruments of rural and urban schools in South Carolina and uncovers its effect on student academic achievement. Educational achievement is assessed based on report card datasets between 2018 and 2019, containing South Carolina Assessment of State Standards (SCPASS) score data and South Carolina College and Career Ready Assessment (SCREADY) score data.

This research project uses a comparative analysis to evaluate each group's performance in the subjects of English Language Arts and science. The statistical analysis tools that this research project uses include analysis of variance (ANOVA), linear regression analysis, and Microsoft Power BI. The datasets are examined to uncover potential differences between rural and urban schools in student achievement and college-career readiness.

The proposed null hypothesis examines standardized mean scores of SCPASS and SCREADY test score data. It reviews the means for standardized scores on the SCPASS and SCREADY to determine if the means are equal between the urban and rural districts. The proposed alternative hypothesis assumes that there is at least one significant difference among the groups described.

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DEDICATION

I chose this topic due to my deep interest in South Carolina public schools. I have always been passionate about education, especially in the Low Country of South Carolina. Being born there and having the fortunate opportunity to attend college at the University of South Carolina, where I have asked fellow students about their public-school experience, has only furthered my interest in this topic. Discovering the disparities in educational opportunities and economic activity between their experiences and mine as a child inspired me to choose a topic that explored these discrepancies. This thesis is dedicated to the rural public-school students of South Carolina. May you never have to experience the obstacles inhibiting your academic progress or the disregard of educational success that I encountered.

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INTRODUCTION

The goal of this thesis is to conduct a comparative analysis between urban school districts and rural school districts within the state of South Carolina (SC) to assess the student performance between the two groups. This research project also discusses school funding instruments of rural and urban schools in South Carolina. As discussed, documented, and observed in the documentary, *Corridor of Shame-The neglect of South Carolina's Rural Schools*, life and opportunities for education are far from picturesque for the collection of schools pooled together along a 200 mile stretch of Interstate-95 in South Carolina titled, "The Corridor of Shame" (Ferillo, 2005). Through narration, the documentary highlights the history of educational funding formulas for these South Carolina schools and the troubling pasts of these communities.

Historically, schools located on the "Corridor of Shame" are nested in small rural towns characterized by winding backcountry roads, pastoral farmland, and perishing infrastructure (Ferillo, 2005). These communities have a long history of inequitable educational funding and economic depression. As authors Lawrence and Moore have discussed, historically, these communities have been faced with crippling underdevelopment. They are troubled by problems ranging from struggling school systems and cyclical poverty to lagging health and social conditions (Moore & Lawrence, 2009). For some school districts in South Carolina, these issues are an afterthought, but for rural districts located in "The Corridor of Shame", these issues are an eye-opening reality. For example, a 2017 report published by the Rural and Community Trust titled, *Why Rural Matters* concluded that rural area graduation rates in South Carolina are among the lowest in the nation. The report noted that South Carolina had the nation's second-lowest rate of rural students taking AP courses at that time. Spending on instruction is low, with teacher salaries ranking below the national average. (Showalter, Johnson, Johnson, & Klein, 2017).

In an updated edition of the report in 2019, The Rural School and Community Trust continue to explain that even though bold promises have been made by national and state leaders to address rural communities, many of the families and children in these rural areas are not getting the attention they deserve as a collective group. The report ranks South Carolina as 8th in the "Top 10 Highest-Priority States in Rural Education" (Showalter, Johnson, Johnson, & Klein, Why Rural Matters 2018-2019 The Time Is Now, 2019). The following section discusses the purpose of the study.

Purpose of the Study

The purpose of this study is to review the relationships between school funding and school location on South Carolina students. This study hopes to raise the awareness of educators, policymakers, and students of the effects that school location and funding instruments have on academic achievement for South Carolina public school students. Academic achievement is an essential measuring point that public schools use to gauge how well students learn the knowledge taught within the classroom. In the South Carolina's Educational Accountability Act, it is a legal provision that all students graduating from public high schools should have the knowledge, skills, and opportunity to be college-ready, career-ready, and life ready for success in the global, digital, and knowledge-based world of the twenty-first century as provided. All graduates should have the opportunity to qualify for and be prepared to succeed in entry-level, credit-bearing college courses without the need for remedial coursework, post-secondary job training, or significant on-the-job training. (South Carolina Code of Laws Unannotated, 2017) Though this is the target set, equipping students with the necessary skills and knowledge to be successful is still a distant reality for some students. There are students in South Carolina school districts who are not equipped with the skills mentioned above or the opportunity to develop those skills (Temony & Ullrich, 2018). South Carolina schools located in the "Corridor of Shame" are places where the path to high academic achievement comes with more roadblocks than stories of success, as shown by this analysis.

With the state of South Carolina ranked among the least educated states in the U.S. by the *Nations Report Card* in areas of reading and math for 4th and 8th-grade students, it a goal of this research to address substandard academic scores amongst South Carolina students to determine if school location and funding instruments are significantly related to this poor performance. After

concluding if there is a difference between rural and urban student performance, the proposed study will review school funding to determine if there is a correlation between funding and student performance in rural and urban locations. Exploring student's academic achievement is important because students who are academically successful are more likely to find more stable employment opportunities, receive more higher-education opportunities, and rely less on social assistance.

Research shows that children who master and excel at the basic reading, writing, and mathematical skills not only graduate from high school at a higher rate but are also successful in their pursuit of related careers and post-secondary opportunities (Fusion, Clements, Sarama, 2015; Carnegie Corporation of New Your, 2009). This past study noted that high academic achievement students develop key skills such as critical thinking, decision-making, and conflict resolution.

Concerning South Carolina, the failure to provide rural students an adequate quality of education in the areas that are economically struggling could delay these children's development of critical thinking and emotional skills as argued by Joes, Greenberg, and Crowley In addition, Joes et.al (2015) and Delta et.al (2013) argued that offering a quality education environment with equal educational opportunities statewide is crucial because it is argued that a person's childhood is one of the most influential stages where children develop critical thinking and emotional skills that can build to a prosperous adulthood and career (Joes, Greenberg, Crowley 2015; Delta Kappa Bulletin, 2013; Akbiyik, 2017. The following section discusses a collection of literature centered around South Carolina student education and rural school research.

LITERATURE REVIEW

This section covers the review of literature for this research project. The review starts by exploring the court case, Abbeville County School District vs. South Carolina. Then the review transitions to highlighting the significance of rural schools and rural students to the education system. Next, the review transitions to past studies that cover the "Corridor of Shame" and explores the injustices in the educational system in South Carolina. Finally, this section reviews literature related to South Carolina public school testing devices and metrics.

Abbeville County School District vs. South Carolina

South Carolina, a mostly rural state in the landscape, has a history of experiencing inadequate education with rural schools. In the documented case of Abbeville County School District vs. South Carolina, the Supreme Court of South Carolina ruled that the collection of schools in the case were denied the constitutionally required opportunity for a "minimally adequate" education as outlined by the South Carolina Constitution (Abbeville County School District, et al. v. the State of South Carolina, 2014). The beginnings of this case started in 1993, and the final decision would come 21 years later. The plaintiff school districts argued that their students were receiving a more inferior quality of education than that available to children in districts with easier access to wealth.

In 2014, the court ruled that the education funding formula in place at the time denied the constitutionally required opportunity for students to receive an adequate education. The plaintiffs argued that the state distributed funds without regard for school district wealth under the Education Improvement Act (EIA). At the time of trial, many of the plaintiff school districts relied heavily on state-provided funding, receiving as much as 86% of the total costs for

educational programs from the State (Abbeville County School District, et al. v. the State of South Carolina, 2014) Other non-plaintiff districts received significantly less support from the state at this time because they relied more heavily on local funding. The plaintiff districts also contended that the state had taken advantage of the statutory language and placed the burden of funding transportation costs on districts that could not afford this responsibility. All eight of the school districts involved in the court case are located in the "Corridor of Shame." This case has been one of the great attempts at working to lessen the gap in educational quality between communities with more access to wealth and communities that have relatively low assessable property values, which are often rural communities.

As a plan of action, the state was assigned to form a task force in the House made up specifically of lawmakers, representatives, and business leaders from the plaintiff districts. The job of this group would be to develop remedies and submit recommendations to adjust funding allocations, establish new college and career-ready standards, and develop efforts to recruit and retain qualified teachers in these rural schools.

Why Rural Schools Matter

There is a common trend of rural students in South Carolina not receiving the necessary academic and financial assistance these students need to succeed. Closer to today's times, rural schools are continuing to lag behind the schools in more populous and affluent areas of the state (Richard, 2019). This matter is an important trend because if the more affluent South Carolina schools are doing well, producing students on par with state standards, and the struggling schools are being overlooked, this could lead to considerable gaps in educational achievement between the two groups. When it comes to competing for postsecondary and career opportunities within the state, this gap could have major implications for rural students' success after high school.

When it comes to education, rural school students are often overlooked due to their lack of visibility to state legislators and board directors that sit in state capitals where education decisions are made. Despite there being over 7 million students enrolled in rural school districts and 15% of all public-school students in 2019, the invisibility of rural education still persists (Showalter, Johnson, Johnson, & Klein, 2019). As pointed out by the Rural School and Community Trust—a national nonprofit organization that works in researching rural schools and their communities to improve the quality of teaching and school leadership in these areas—many legislators never encounter these rural communities. For those that do have the opportunity to interact with rural area schools, many do not fully understand the intricacies of the challenges that these communities face. Leaving these schools out of research can cause their issues of poverty, isolation, and inequity they experience to be further exacerbated.

In 2019, the Rural School and Community Trust released a report titled, *Why Rural Matters 2018-2019 The Time Is Now*. This report utilized data provided by the National Assessment of Educational Progress (NAEP) distributed by the National Center for Education Statistics (NCES). The report combined overall NAEP performance into one indicator. The report explored various key gauge areas such as student and family diversity and college and career readiness. The report results showed that rural students were much less likely than their peers nationwide to pass Advanced Placement (AP) courses to qualify for college credit. Only 9.5 percent of rural students met this criterion, compared with 19 percent for all U.S. high school students, 18.8 percent of urban students, and 24.1 percent of suburban students (Showalter, Johnson, Johnson, & Klein, 2019). Despite sub-average college and career readiness indicators, the report expressed that rural students outscored their non-rural counterparts on the *Nation's Report Card* for most states that had enough rural students to make data available (Showalter,

Johnson, Johnson, & Klein, 2019). The report concluded that even though some rural schools and places thrive, others continue to face nothing less than an emergency in the education and well-being of children.

The report also outlined that for South Carolina, 4 in every 10 schools in South Carolina are in rural areas, compared to less than three in 10, the national average. More than one in five of the state's nearly 120,000 rural students live in poverty for these rural schools, further showing the need for more equitable educational opportunities for these students. Instructional spending and teacher salaries are well below the national average (Showalter, Johnson, Johnson, & Klein, 2019). Rural students' performance on NAEP math and reading tests were among the lowest in the U.S., and the gaps between South Carolina's rural and non-rural students—and between rural students living in poverty and their other rural peers— also were among the nation's widest. However, the average improvement in student achievement is high between grades 4 and 8 in reading and math. Rural students are on par with their non-rural peers on earning AP credits and participation rates for taking college-entrance exams but have lower graduation rates and dual enrollment credit rates than rural students nationally (Showalter, Johnson, Johnson, & Klein, 2019).

Even if some rural schools are doing well, the collective group has been neglected. With more than 46 million Americans living in nonmetropolitan areas, there is a great need to focus attention on efforts in these areas (Showalter, Johnson, Johnson, & Klein, Why Rural Matters 2018-2019 The Time Is Now, 2019). The days of schools and communities of isolation are diminishing due to the increased interconnectivity of people thanks to things like the internet. Even though smaller than the urban and suburban groups, rural communities will always exist. Rural communities are often birthplaces of rich culture and traditions and play a vital role in

agricultural production. They deserved to be invested in just as urban and suburban areas are. This next section discusses education inequity in South Carolina.

Education Inequity

This section discusses educational inequity in rural schools throughout the Unitized States and specifically for South Carolina.

Past studies that have investigated rural and urban students have noted differences in their trajectories as they advanced to adulthood. This creates a challenge for rural students who are entering postsecondary schooling at a lag (Wells, 2019). Wells (2019) examined the disparities in students' postsecondary trajectories, influences, and outcomes over time for both urban and rural students. Wells (2019) discovered that the gaps between urban and rural students are narrowing, but rural students still faced more persistent challenges when it comes to college enrollment and degree completion. Groups of urban students still experience higher college enrollment rates and degree completion on average compared to their rural peers. Wells' study findings further echo the sentiment that the educational pathway for rural students is more difficult than that of their urban student counterparts. To solve these educational barriers, past studies have noted that one must examine whether rural schools and districts first have the adequate resources and the infrastructure to implement programmatic innovation to begin with.

Urban and rural locations play a role in the beliefs of each student when trying to address the issue of education inequity in the classroom. Based on the analysis done by the Center of Public Education, rural schools face barriers to filling vacant positions because of less funding, and students have limited access to advanced coursework. Rural schools face significant resource limitations, particularly in terms of economic insecurity and human resources (Lavalley, 2018).

In addition, there are social, cultural, and political forces that can influence the capacity of rural schools to improve. Because of these influences, priority should be given to developing and testing strategies that build school and district capacity to improve student achievement.

The failure to provide rural students in these economically struggling rural environments with equal educational opportunities statewide is important because a person's childhood where children develop critical thinking and emotional skills that can build to prosperous adulthoods (Showalter, Johnson, Johnson, & Klein, 2019). Students in rural areas often come from economically challenged backgrounds, so providing these students with adequate education would be beneficial in helping them to succeed far beyond schooling. Prior studies that examined early childhood education conducted by the Rural School and Community Trust demonstrated that there were indeed substantive long-term benefits to children from economically disadvantaged homes who received high-quality early education. Primary education builds the foundation for high-school graduation rates, college acceptance, behavioral challenges, and employability (Bakken. L., 2017). The next section explores education inequity as it relates to the "Corridor of Shame."

The Corridor of Shame

Under the No Child Left Behind Act (NCLB), schools were required to work to ensure that all students are taught to high academic standards to prepare them to succeed in college and their careers (U.S. Department of Education, 2021). The NCLB was later succeeded by the Every Student Succeeds Act (ESA) in 2015. These acts were created as instruments to help reduce the achievement gap among students, especially for the lowest-performing schools, where students were struggling to make progress. Even though optimistic, the act's missions do not hold true for the collection of schools located in the "Corridor of Shame." NCLB and ESA are irrelevant if

students are not in an environment conducive to learning to begin with. Passing laws and implementing policies are void when students are inhibited by busses failing to deliver students to school on time reliably, buildings that cannot be used because they lack sufficient utilities, and teachers who aren't properly certified. Research regarding past publications has shown that many of the schools in the "Corridor of Shame" lack the adequate resources needed to provide students with a comprehensive educational experience. When discussing the property tax structure helping to fund South Carolina schools at the time senator, Lindsey Graham stated, "the reason we have disparity in funding is not because we're prejudiced at the governmental level, it's because we collect taxes based on property values. Our property values in those counties are pretty low because there's no industry. It is an economically deprived area" (Ferillo, 2005).

It is important to note that the schools in the court case are overwhelmingly comprised of ethnic minority students. For minorities from low-income areas, it naturally takes additional resources to overcome issues of poverty and provide students with a quality robust education. Research involving New York City schools revealed that the poor-performing schools, as measured by student test scores, served mainly economically disadvantaged and minority students. Schools with higher percentage scores. These schools were also associated with low student attendance rates, teachers with limited teaching experience of non-white students, and a higher percentage of students eligible for free lunch. (Stiefel, Schwartz, & Iatarola, 2000, Stiefel, Schwartz, & Iatarola, 2001).

Past studies further support the notion that these rural area schools experiencing heightened obstacles to achieving quality and equitable education. Lower-income students often have limited access to enriching educational services and schooling, which can lead to much greater problems than those just presented inside of the classroom (Owens, 2018). Studies

indicate that insufficient schooling amidst other factors early in a child's life can lead to changes in brain structure, cognitive skills, and lower academic achievement (Tran, Lutchers, & J.Fisher, 2016). Rural students are not just experiencing difficulty inside of the classroom, but also struggle to gain the necessary skills needed to cope with negative outcomes in a healthy way. When looking into the effect that rural environments have on students' internal motivation, urban students possess more self-motivation than rural students. The educational aspirations of rural youth lag behind those of their urban counterparts. Rural students placed less value on academics. (Arnold, 2005).

In addition, there are still accounts of students in these rural communities not having the resources they need. Kambrell Garvin, SC House Representative, still gives accounts from his experience teaching in Walterboro, South Carolina from 2013-2016, where students lacked basic educational opportunities, like science fairs and field trips (Winthrop University, 2020). With the presence of virtual environments growing as a method for delivering education, how will these rural students continue to adequately learn if they cannot afford the technological resources that others so easily have access to? The state reported that rural students struggle to learn because of slower internet speeds. These rural and low-income students are unable to access online courses the same way that their middle-class or urban peers can (Daprile, 2020). There is a severe disservice done for these schools and the students of underserved areas if this issue is not addressed. The next section will discuss research investigating independent variables and their effect on student performance.

Predictors of Student Performance

This section presents past research regarding predictors of student performance in South Carolina. Past studies have shown that measured variables such as basic family incomes and

demographics tend to correlate to student academic performances. Prior studies also showed that the geographic location of school indeed influences student performance, but the gap between rural and urban students' achievement is not considered large enough to cause concern. A study conducted by Dr. McCord, a student of South Carolina State University at the time, explored student characteristics such as location, socio-economic status, and school size were investigated to discover if they had any influence on student performance. The study concluded that school and student characteristics such as location, socio-economic status, and school size are indeed relevant predictors of student achievement.

Dr. McCord's study compared 209 schools and over 54,000 student test scores during the 2012 and 2013 school years. The schools used in the experiment were separated into categories based on the school locale (metropolitan/rural), school size (smaller schools with less than 500 students, and larger schools greater than 500 students), 10^{th} grade enrollment size (less than or greater than 100 students), and student poverty on student achievement and school absolute rating. At the time of the experiment, the South Carolina Department of Education indicated that academic achievement in South Carolina was measured by the High School Assessment Program (HSAP). The HSAP is an exit examination test designed to measure the academic achievement of students. The areas covered on the HSAP included reading, language arts, and mathematics (South Carolina Department of Education).

McCord, who is currently the superintendent of the Marlboro County school district, conducted this research in an effort to hold schools accountable for their effects on student outcomes. Each hypothesis in this research study was analyzed at the $p < 0.05$ alpha level of significance. There was determined to be a significant positive relationship between high school size and academic achievement of high school students for English Language Arts (ELA) and

mathematics. There was also a significant positive relationship between high school size and academic achievement of urban-specific high school students for ELA and mathematics. For rural high school students, there was no significant relationship between high school size and academic achievement for students in ELA and mathematics. For the poverty index, there was a significant negative relationship found between poverty index ratings and academic achievement of high school students. This significant negative relationship also held true for both rural and high school students as well. Lastly, there was determined to be a significant positive relationship between growth ratings and academic achievement of high school in ELA and mathematics. This significant positive relationship also persisted for rural high school students and urban high school students as well for ELA and mathematics. All significant relationships cited above were significant at the 1% level. The final analysis showed that schools in both groups (urban and rural) displayed high student achievement despite school location and school size. Students from both groups show incremental gains even if there is a correlation between high poverty indexes and declining achievement. Surprisingly, this study suggested that even though there is a gap that exists between urban and rural high schools in South Carolina, overall, the variables tested do not have as much impact as believed in helping urban and rural students reach their educational goals.

Other studies have also suggested that school characteristics are important when it comes to predicting student achievement (Shera and Perparim, 2016). Shera and Perparim (2016) examined the characteristics of urban and rural on student performance. They concluded that there was indeed a relationship between the characteristics of students who attended rural schools and student performance. The following section covers South Carolina education standards.

South Carolina Education Standards

This section covers South Carolina Standards that guide curriculum development, and instructional practices, and assessment. South Carolina Education Standards are year-end goals for student learning which inform and guide curriculum development, instructional practices, and assessment. South Carolina education standards are designed to ensure that South Carolina students are prepared to enter and succeed in economically viable career opportunities or postsecondary educational opportunities that lead to a career. Across the state of South Carolina groups of educators collaborate to create the South Carolina College and Career-Ready Standards to set clear expectations for the skills and knowledge students K-12 must illustrate as they progress through each grade level.

The standards review groups are composed of community stakeholders, classroom teachers, instructional coaches, district leaders, and education faculty who specialize in English language learning, special education, career and technology education, and assessment who come together to draft and revise educations standards. To create a sense of transparency and inclusiveness, the public is also allowed an opportunity to share feedback on the drafting of standards during the review process.

As stated by the South Carolina Department of Education, the standard writing and review process is crucial to consensually create a clear set of education standards to prepare students for success in school and life. In South Carolina, standards are provided for each grade level from kindergarten through grade eight, all high school required courses, and selected electives. The following paragraph discusses English Language Arts.

English Language Arts

This section covers English Language Arts. South Carolina English language arts standards focus on the fundamentals of reading, writing, and communication. These standards are divided into 5 strands. The Fundamentals for each strand, while not assessed, are an integral part of the South Carolina College- and Career-Ready English Language Arts Standards. The 5 strands are Inquiry– Based Literacy (I), Reading – Literary Text (RL), Reading – Informational Text (RI), Writing (W), and Communication (C). The standards that fall within these categories present expectations for teaching and learning. The next section covers the standards of Mathematics in South Carolina.

Mathematics

This section presents the mathematic standards mandated by the South Carolina Department of Education (SCDE). SCDE indicates that educational math standards are filled with a variety of content to equip students with a strong balance of conceptual and procedural knowledge. The standards are designed to provide the student with a toolbox of mathematical procedures, concepts, and facts, to describe, explain, and predict phenomena.

In addition, Mathematically literate students should be able to make sense of problems and persevere in solving them, reason both contextually and abstractly, use critical thinking skills to justify mathematical reasoning, critique the reasoning of others, connect mathematical ideas and real-world situations through modeling, use a variety of mathematical tools effectively and strategically, communicate mathematically and approach mathematical situations with precision, and identify and utilize structure and patterns.

The standards are designed to help students develop the ability to reason logically and strategically apply the appropriate math and technical skills to model and solve problems. The next section covers science standards as SCDE described.

Science

As of February 2021, the current science standards are being updated to develop new standards for the upcoming fall 2021 school year. Historically, broad standards addressed the topics of life, earth, and physical science core content. Seven of the common threads or themes presented in a Framework for K-12 Science Education include (1) patterns, (2) cause and effect: mechanism and explanation, (3) Scale, Proportion, and Quantity, (4) Systems and System Models, (5) Energy and Matter: Flows, Cycles, and Conservation, (6) Structure and Function, and (7) Stability and Change.

These concepts should not be taught in isolation but reinforced in the context of instruction within the core science content for each grade level or course. Overall, students should walk away with the ability to ask questions and define problems, develop and use models, plan and conduct investigations, analyze and interpret data, use mathematical and computational thinking, construct explanations and design solutions, and engage in scientific argument from evidence, and obtain, evaluate, and communicate information. The science standards are a roadmap to teaching students unique ways of understanding the physical universe using observation and experimentation. The next section discusses social studies standards for public schools in the state of South Carolina.

Social Studies

This section covers social studies standards in the South Carolina education system**.** South Carolina social studies standards are comprised of a combination of state requirement

standards and legislative requirements such as teaching the history of South Carolina. The four themes seen throughout the social studies standards include history, economics, geography, and civics and government. While the standards in the primary grades are these actual four themes, subsequent courses are built on sub-themes of the original four.

In addition to the nine grade levels (kindergarten through grade 8), three required high school courses are required to fulfill the sub-theme standards. These courses include United States History, United States Constitution, Economics, and United States Government. From these standards, students should be able to take the social studies content they have learned and apply it to address societal issues in a responsible manner. The following paragraph covers the goals and progression of education standards at each grade level. (Department of Education State of South Carolina, 2018)

The Progression of Academic Standards

For each grade level and high school core area, academic standards describe the specific areas of student learning that are considered the most important for proficiency in the discipline at the particular level. Because of this, the discipline-specific skills begin at the kindergarten level and progress to graduation with developmentally appropriate iterations of the same skill being further honed at each grade level. To be college-and career-ready, students should both understand skills and know-how to apply those skills.

The educational standard draft and publication process is designed to prepare students to master these skills successfully. Through these standards, the South Carolina Department of Education strives to create a high school graduate who possesses world-class knowledge, world-class skills, and beneficial life and career characteristics. The following section covers South Carolina's tools and mechanisms for measuring student achievement.

Tools for Assessment of Student Achievement

Every Student Succeeds Act

This section presents information regarding the assessment mechanism and tools South Carolina uses to ensure that schools are producing college and career-ready high school graduates. Every Student Succeeds Act (ESSA) passed in 2015 is the nation's governing education law for all public schools to help ensure success for students and schools (ESSA, 2015). ESSA (2015) requires that all states test students in the areas of reading or language arts and also math. The ESSA mandates every year that students are required to be tested in grades 3-8 and once in grades 9-12. The ESSA has a science testing component as well. Students in grades 3-8 must be tested at least three times in science, with assessment falling once within the grades 3-5, once within grades 6-9, and once in grades 10-12.

South Carolina public schools (SCPS) fulfill the ESSA English Language Arts (ELA) and mathematics testing requirements through the South Carolina College-and Career-Ready Assessments (SC READY). South Carolina public schools fulfill the high school testing requirements through the English 1 End of Course Exam and the Algebra 1 End-of-Course Examination Program. SCPS fulfills the high school testing requirements through the English 1 End of Course Exam and the Algebra 1 End-of-Course Examination Program (EOCEP).

SCPS meets the ESSA science testing requirement through the South Carolina Palmetto Assessment of State Standards (SCPASS) administered to students in grade 4 and grade 6 or 8. For the last group of grade levels, grades 10 -12, the South Carolina Biology 1 End-of-Course Examination Program is used to fulfill the ESSA science testing requirement at the high school level.

South Carolina also uses a plethora of other assessments not required by federal law to assess student's knowledge. These assessments include but are not limited to the SCPASS Social Studies for grades 5 and 7, Ready to Work (R2W) Career Readiness Assessment in grade 11, U.S. History and the Constitution End of Course Exam, and SCPASS Science in one middle school grade. The next paragraph discusses the Palmetto Assessment of State Standards (SCPASS).

Palmetto Assessment of State Standards (SCPASS)

The SCPASS is a statewide assessment program that measures student performance against South Carolina Academic Standards in the areas of Science and Social Studies. The first initial administration of the SCPASS was in spring 2009. All students in grades 4, 6, and 8 are required take SCPASS Science. All students in grades 5 and 7 are required to take SCPASS Social Studies. All students who fall in corresponding grade levels for each assessment are required to take the SCPASS, including students with disabilities. Students may however qualify for Alternative Assessment in special circumstances (SCDOE).

SCPASS test results are reported based on three factors. The first factor in SCPASS score reporting are scale scores. Scale scores are a three or four-digit number that can help identify the student's grade level and evaluate a student's overall performance level. Each scale score corresponds to a performance level that gives further insight into the student's score results. The second factor in scoring is performance level. For each version of the assessment (Science and Social Studies), there are performance levels that define student mastery of the skills and knowledge outlined for the test.

SCPASS Science

The SCPASS Science has four performance levels categorized from lowest to highest as—Does Not Meet Expectations, Approaches Expectations, Meet Expectations, and Exceeds Expectations. The SCPASS Social Studies has 3 levels categorized from lowest to highest as—Not Met, Met, and Exemplary. Each of the performance levels concisely describes the student's performance and outlook on the student's ability to be successful at the next grade level. These performance levels are useful for evaluating a school's overall performance as well. The performance levels for SCPASS Science are listed below.

- Does Not Meet Expectations—The student does not meet expectations as defined by the grade-level content standards. The student needs substantial academic support to be prepared for the next grade level.
- Approaches Expectations—The student approaches expectations as defined by the grade-level content standards. The student needs additional academic support to be prepared for the next grade level.
- Meets Expectations—The student meets expectations as defined by the grade-level content standards. The student is considered to be prepared for the next grade level.
- Exceeds Expectations—The student exceeds expectations as defined by the grade-level content standards. The student is considered to be well prepared for the next grade level.

The performance levels for the SCPASS Social Studies are listed below.

- Not Met—The student did not meet the grade-level standard.
- Met—The student met the grade-level standard.

- Exemplary—The student demonstrated exemplary performance in meeting the grade-level standard.

The third scoring factor is performance by standards. This scoring classification is based on a subset of items that assess the appropriate standards for each grade level. For SCPASS Science, student performance by standard is classified into one of three categories: low, middle, or high.

Listed below are samples from the SCDOE of the score ranges for SCPASS Science and the SCPASS Social Studies for 2019 (Office of Assessment, 2019).

The following table displays the scale score ranges that correspond to the four overall performance levels for grades 4, 6, and 8 science.

SCPASS Science Scale Score Ranges

Grade	Does Not Meet	Approaches	Meets	Exceeds
4	1370–1433	1434–1449	1450–1467	1468–1530
6	1570–1636	1637–1649	1650–1664	1665–1730
8	1770–1834	1835–1849	1850–1867	1868–1930

Note: As provided in the table, science scale scores range from a minimum of 1370 to a maximum of 1930. These minimum and maximum scale scores, which are referred to as the lowest obtainable scale score (LOSS) and the highest obtainable scale score (HOSS), are the theoretical minimum and maximum scores. However, these theoretical minimum and maximum scores are not always obtainable in practice. For any particular grade, for example, the obtainable maximum scale score can be, and often is, less than the HOSS. Regardless of the obtainable minimum and maximum scale scores, the LOSS and HOSS will be the lowest and highest points on the Individual Student Report (ISR).

SCPASS Social Studies Scale Score Ranges

Grade	Not Met		Met	Exemplary	
	Not Met 1	Not Met 2		Exemplary 4	Exemplary 5
5	300–569	570–599	600–657	658–673	674–900
7	300–561	562–599	600–645	646–662	663–900

Note: As provided in the table, social studies scale scores range from a minimum of 300 to a maximum of 900. These minimum and maximum scale scores, which are referred to as the lowest obtainable scale score (LOSS) and the highest obtainable scale score (HOSS), are the theoretical minimum and maximum scores. However, these theoretical minimum and maximum scores are not always obtainable in practice. For any particular grade, for example, the obtainable maximum scale score can be, and often is, less than the HOSS. Regardless of the obtainable minimum and maximum scale scores, the LOSS and HOSS will be the lowest and highest points on the Individual Student Report (ISR).

Listed below are samples from the SCDOE of how a sample score report layout could look for a student who took the SCPASS Science or the SCPASS Social Studies (Office of Assessment, 2019).

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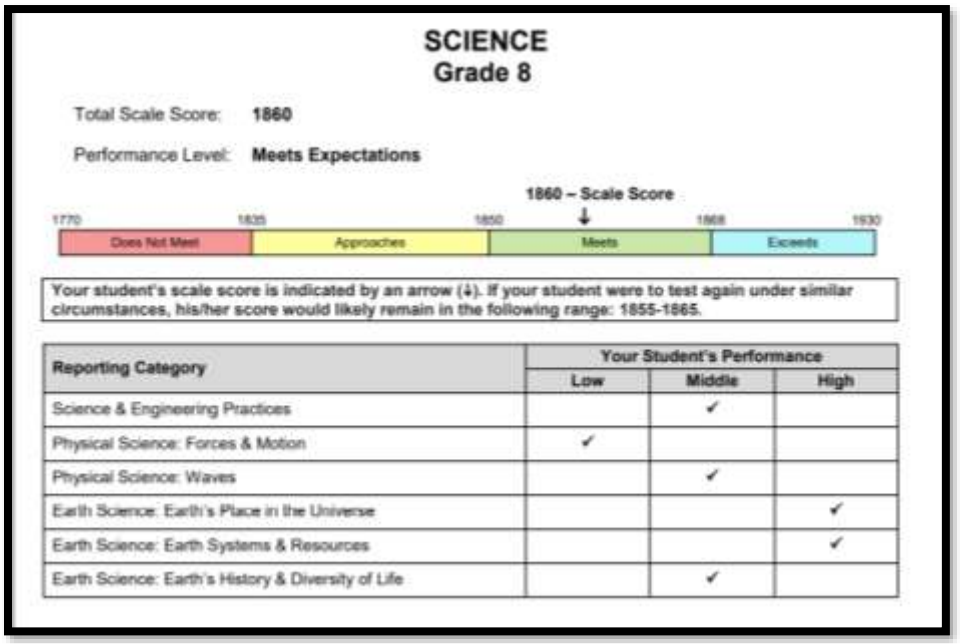


SCIENCE
Grade 8

Total Scale Score: **1860**

Performance Level: **Meets Expectations**

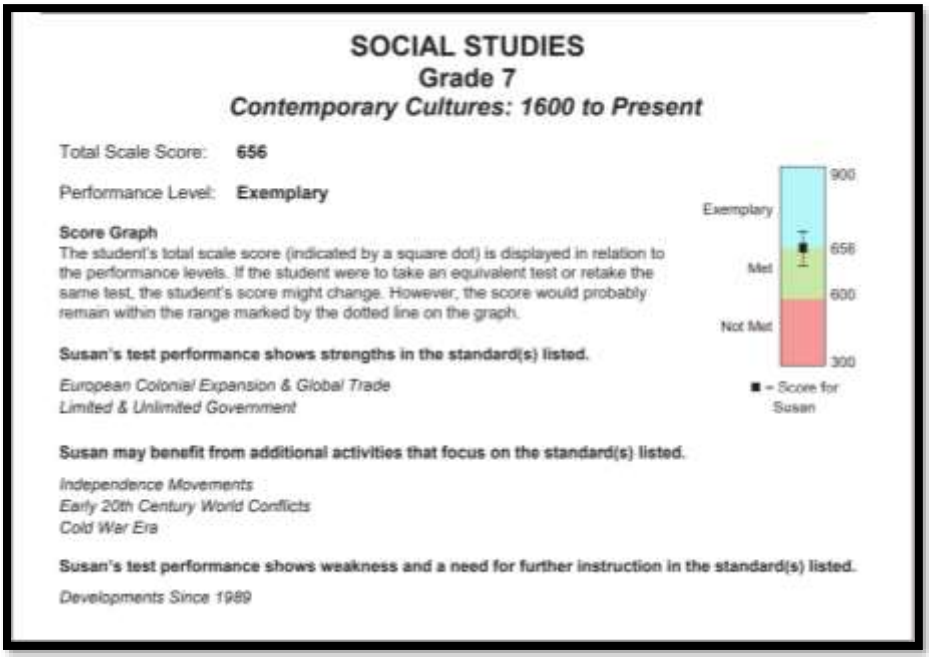
1860 – Scale Score

1770 | 1835 | 1850 | 1868 | 1930

Does Not Meet | Approaches | Meets | Exceeds

Your student's scale score is indicated by an arrow (↓). If your student were to test again under similar circumstances, his/her score would likely remain in the following range: 1855-1865.

Reporting Category	Your Student's Performance		
	Low	Middle	High
Science & Engineering Practices		✓	
Physical Science: Forces & Motion	✓		
Physical Science: Waves		✓	
Earth Science: Earth's Place in the Universe			✓
Earth Science: Earth Systems & Resources			✓
Earth Science: Earth's History & Diversity of Life		✓	



SOCIAL STUDIES
Grade 7
Contemporary Cultures: 1600 to Present

Total Scale Score: **656**

Performance Level: **Exemplary**

Score Graph
The student's total scale score (indicated by a square dot) is displayed in relation to the performance levels. If the student were to take an equivalent test or retake the same test, the student's score might change. However, the score would probably remain within the range marked by the dotted line on the graph.

Exemplary | Met | Not Met

900 | 656 | 600 | 300

■ = Score for Susan

Susan's test performance shows strengths in the standard(s) listed.

European Colonial Expansion & Global Trade
Limited & Unlimited Government

Susan may benefit from additional activities that focus on the standard(s) listed.

Independence Movements
Early 20th Century World Conflicts
Cold War Era

Susan's test performance shows weakness and a need for further instruction in the standard(s) listed.

Developments Since 1989

South Carolina College-and Career-Ready Assessment (SCREADY)

The South Carolina College-and Career-Ready Assessments (SC READY) is a statewide assessment in English language arts (ELA) and mathematics that meets all of the requirements of Acts 155 and 200, the Elementary and Secondary Education Act (ESEA). All students in grades 3–8 are required to take the SC READY except those students with significant cognitive disabilities who qualify for the South Carolina Alternate Assessment (SCDOE, 2020). The standards tested on the SCREADY ELA and math assessment aligns with the standards from the 2015 State Board Approved South Carolina college- and career-ready standards for ELA and mathematics.

SC Ready standards specify what students are expected to learn and include indicators for progress in students learning. These indicators are statements of specific cognitive processes and content knowledge that students must meet for each grade level.

SC READY ELA and Math Sections

All items on the SC READY English language arts (ELA) section of the Assessment are scored as right or wrong except for the text-dependent analysis (TDA) questions. For these questions, the student must read a passage and then draw upon that text as evidence to develop a writing response. TDA items are scored using a rubric ranging in point values of 1 (lowest) to 4 (highest). The TDA rubric score is then weighted by a factor of 2 for a maximum of 8 possible points for these questions. For non-TDA questions, these questions receive a score value of one point if the answer is correct and a score value of 0 if the answer is incorrect or left blank.

For the SCREADY ELA and math sections, there are 4 performance levels to describe student mastery and command of the knowledge and skills outlined by the state standards. The four performance levels are listed below.

- Does Not Meet Expectations – The student does not meet expectations as defined by the grade-level content standards.
- Approaches Expectations – The student approaches expectations as defined by the grade-level content standards.
- Meets Expectations – The student meets expectations as defined by the grade-level content standards.
- Exceeds Expectations – The student exceeds expectations as defined by the grade-level content standards.

In 2016-2017 SCREADY assessment scores transitioned to a vertical scale. A vertical scale is one in which a given scale score value shows the same amount of achievement, regardless of the grade level in which the student is tested. Therefore, as students increase in grad-level, so should their scale scores. Each overall performance level is defined by scale scores (Office of Assessment, 2019)

Listed below are samples from the SCDOE of the score ranges for SCREADY ELA and mathematics assessments. (Office of Assessment, 2019)

SC READY Performance Level Scale Score Cuts

ELA Vertical Scale Score Ranges

Grade	Does Not Meet	Approaches	Meets	Exceeds
3	100-358	359-451	452-539	540-825
4	100-418	419-508	509-592	593-850
5	100-449	450-557	558-652	653-875
6	100-454	455-575	576-667	668-900
7	100-511	512-614	615-704	705-925
8	100-537	538-642	643-737	738-950

Mathematics Vertical Scale Score Ranges

Grade	Does Not Meet	Approaches	Meets	Exceeds
3	100-359	360-437	438-543	544-825
4	100-401	402-481	482-562	563-850
5	100-447	448-535	536-621	622-875
6	100-453	454-542	543-627	628-900
7	100-487	488-577	578-649	650-925
8	100-526	527-614	615-683	684-950

Listed below are samples from the SCDOE of how a sample score report layout could look for a student who took the SCREADY ELA or the SCREADY Math (Office of Assessment, 2019)

SAMPLE INDIVIDUAL STUDENT REPORT (GRADE 6 EXAMPLE—PAGE 1)

SC READY
South Carolina College- and Career-Ready Assessments

Individual Student Report

Edward D. Eckhart, Grade 6

Date of Birth:	05/13/2006	**District:**	Middleville 1
Student ID:	100012341258	**School:**	Middleville Middle School
Test Date:	Spring 2019	**Fall Assign School:**	None

English Language Arts (ELA)

Scale Score – ELA Total Test	680
Scale Score – Reading	675

Scale Scores
Student raw score points have been mathematically changed to scale scores. This allows scores to be reported for all students on a consistent scale.

Your Child's ELA Test Results	
Performance Level – ELA Total Test	Exceeds
Performance Level – Reading	Exceeds
Lexile Range	700L-799L

Lexiles
Lexile ranges describe a student's level of reading achievement. Your child's Lexile measure is shown as a range between two numbers, followed by an "L."

What Does My Child's Score Mean?

There are four levels of scores on the ELA and mathematics assessments. Achievement levels "Exceeds Expectations" and "Meets Expectations" are the state targets for all students.

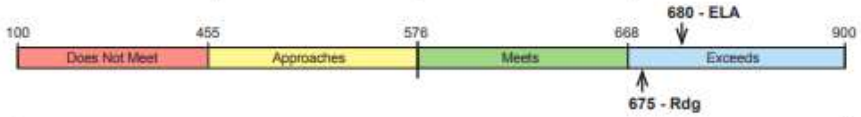
Performance Levels

Does Not Meet Expectations: The student does not meet expectations for the required knowledge and skills, as defined by the grade-level content standards. The student needs substantial academic support to be prepared for the next grade level and to be on track for college and career readiness.

Approaches Expectations: The student approaches expectations for the required knowledge and skills, as defined by the grade-level content standards. The student needs additional academic support to be prepared for the next grade level and to be on track for college and career readiness.

Meets Expectations: The student meets expectations for the required knowledge and skills, as defined by the grade-level content standards. The student is prepared for the next grade level and is on track for college and career readiness.

Exceeds Expectations: The student exceeds expectations for the required knowledge and skills, as defined by the grade-level content standards. The student is well-prepared for the next grade level and is well-prepared for college and career readiness.



Your child's scale score is indicated by an arrow (⇓). If your child were to test again under similar circumstances, his/her score would likely remain in the following range: 670-690 for ELA total and 665-685 for Reading (Rdg) subscore.

ELA Performance Level Descriptors (PLDs)

PLDs show a progression of knowledge and skills that students are expected to have mastered across the performance levels. The following are some examples of what a typical student can do at the "exceeds expectations" achievement.

A student who scores in the "exceeds expectations" category typically can:

- Cite relevant evidence to support analysis and make complex inferences of literary and informational texts.
- Determine how specific details convey the theme of a literary text.
- Provide an objective summary of literary and informational texts.
- Compare and contrast how literary texts of different forms or genres approach similar themes or topics.

Edward D. Eckhart, Grade 6 Page 1 | Spring 2019

SAMPLE INDIVIDUAL STUDENT REPORT (GRADE 6 EXAMPLE—PAGE 2)

SC READY
South Carolina College- and Career-Ready Assessments

Individual Student Report

How do my child's ELA scores compare with his/her scores from previous years?

Your Child's ELA Score History						
	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Scale Score	554	576	665	680		
Performance Level	Meets	Meets	Exceeds	Exceeds		

How does my child's ELA score compare with other students?

Your Child's ELA Percentile Rank Comparisons	
South Carolina	89
Other States with Comparable Standards	59

Percentile Ranks

A percentile rank compares your child's score to other students in a group. Percentile ranks range from 1 to 99, with 99 being the highest. The rank is the percentage of students in the comparison group who scored the same as or below your child's score. The table to the left shows your child's percentile ranks, comparing your child's score to the scores of students in South Carolina and to student scores in other states.

How did my child perform on the ELA academic standards?

Reporting Category	Your Child's Performance		
	Low	Middle	High
Reading - Literary Text			✓
Meaning and Context		✓	
Language, Craft, and Structure			✓
Reading - Informational Text			✓
Meaning and Context		✓	
Language, Craft, and Structure			✓
Inquiry		✓	
Writing (also includes TDA item - see below)		✓	
Meaning, Context, and Craft		✓	
Language			✓

Text Dependent Analysis

Part of the writing test is a text-dependent analysis item. The TDA requires students to read a piece of text or a passage and respond to a question. Students are instructed to provide evidence for their responses from the text or passage. The TDA is scored with a holistic rubric with a point range of 1 (lowest) to 4 (highest). To reflect the importance of student produced writing, the writing score is then weighted by a factor of 2 for a maximum of 8 points.

Your child's TDA score: 7 of 8 points

SAMPLE INDIVIDUAL STUDENT REPORT (GRADE 6 EXAMPLE—PAGE 3)

SC READY
South Carolina College- and Career-Ready Assessments

Individual Student Report

Mathematics

The SC READY mathematics test includes questions covering the five areas of the South Carolina College- and Career-Ready Standards: The Number System; Ratios and Proportional Relationships; Expressions, Equations, and Inequalities; Geometry and Measurement; and Data Analysis and Statistics. All areas count toward the total scale score and the overall mathematics performance level.

Scale Score – Mathematics	548

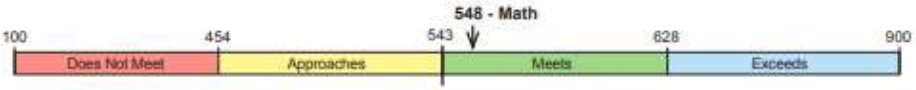
Scale Scores

Student raw score points have been mathematically changed to scale scores. This allows scores to be reported for all students on a consistent scale.

Your Child's Mathematics Test Results	
Performance Level – Mathematics	Meets
Quantile Range	555Q–595Q

Quantiles

Quantile ranges describe a student's level of mathematics achievement. Your child's Quantile measure is shown as a range between two numbers, followed by a "Q."



Your child's scale score is indicated by an arrow (▼). If your child were to test again under similar circumstances, his/her score would likely remain in the following range: 538–558.

Mathematics Performance Level Descriptors (PLDs)

PLDs show a progression of knowledge and skills that students are expected to have mastered across the performance levels. The following are some examples of what a typical student can do at the "meets expectations" achievement level. The list of PLDs are not comprehensive and should not be used as a substitute for the complete set of South Carolina College- and Career-Ready Standards from which they are taken.

A student who scores in the "meets expectations" category typically can:

- Divide decimals by decimals and divide fractions by fractions.
- Compute fluently with multi-digit whole numbers using all four operations.
- Determine the vertical or horizontal distance between two points on a coordinate plane.
- Plot and identify ordered pairs in all four quadrants.
- Solve one-step real-world and mathematical problems that involve ratios and unit rates.

South Carolina Public School Funding

In 2018, funding for South Carolina public schools is resourced from multiple channels such as the Education Finance Act of 1977 (Act 163), Education Improvement Act of 1984, the Child Development Education Pilot Program, state restricted funding, education lottery act programs, and federally funded programs. The Education Finance Act appropriation for 2018-2019 was $1,822,608,440 (Department of Education State of South Carolina, 2018). The amount of funding that South Carolina provides to each school district is the difference between the total cost for the district to provide the foundation program and the district's required local support. Each district is required to provide 30 percent of the cost of their foundation program multiplied by the taxpaying ability index of that district. Each district's taxpaying ability is relative to the fiscal capacity of all other districts in the state, based on the full market value of all taxable property in that district.

While school funding is a vital element in providing students a quality education, it is not the only factor in determining student achievement. Recently in 2017, South Carolina took control of Allendale County schools, declaring a "state of emergency", a tactic that had not been attempted since 1999. Three of the four schools in the Allendale County School District were taken under control by the state. The Allendale County schools ranked in the bottom five percent academically of all schools in the state. Even with receiving some of the highest per-student funding at over $17,000 per-student in local, state, and federal funds, the school still showed poor results. State Superintendent of Education expressed that she had "significant concerns about district finances not being used efficiently nor effectively" (South Carolina Department of Education, 2017). State's education funding does matter when predicting the academic achievement of a student. More funding helps ensure that students have better facilities, stronger

teaching talent, and sufficient academic materials, but only if the funds are being used appropriately. The next section covers the approach and the methodology this research project follows to collect data and identify rural and urban schools in South Carolina.

APPROACH & METHODOLOGY

Data Collection

This research study uses secondary data sources. Data were collected from the South Carolina Department of Education, the U.S. Bureau of Labor Statistics, and the U.S. Bureau of Economic Analysis. Once the data were cleaned, it was divided into rural school districts and urban school districts. This research used a comparative analysis methodology.

This research project follows and is grounded upon what researchers at the Massachusetts Institute of Technology and Harvard University call the academic "achievement gap." The achievement gap term was coined in a study that expands on the concept that lower-income students tend to suffer from more stress in early childhood and receive less exposure to spoken language and enhanced vocabulary structures early in life.

Datasets containing test scores for each of the South Carolina standardized assessments mentioned in the introduction were reviewed. (SCREADY and SCPASS) For each test, the test score data is separated into two subgroups. The first data set consists of rural school test score data. The second data set consists of urban school test score data. Datasets were analyzed on the quality of education and performance of the tested students with the standardized tests. The next section discusses the definition of rural and urban and sample groups.

Sample Groups

Rural vs. Urban

As described, this thesis project compares the performance of the students who attend the rural and urban schools in South Carolina. Prior studies noted that it is crucial to determine how rural K-12 and urban K-12 schools will be identified to produce a sufficient study that yields unbiased outcomes. This proposed research will rely on the United States federal government's definition of rural and urban.

This most common definition of rural that will be used — also used by the U.S. Census Bureau—is an area that falls outside of an urban area or an urban cluster. An urban area is characterized to contain 50,000 or more people, and an urban cluster contains 2,500-50,000 people. Therefore, this research is grounded on this most common definition of rural (School of Medicine, 2020). The following section covers hypothesis testing.

Hypothesis Testing

This research project evaluates the differences in the quality of education for students attending rural and urban schools in South Carolina based on mean average test scores. If there is indeed a discovery of differences in the mean average test scores between the rural students and urban K-12 students, a statistical significance ANOVA test will provide conclusive evidence of the difference in academic performance between the two sample categories.

The following are the hypotheses of this research project study.

Null Hypotheses

H01: There is no relationship between school location and South Carolina student performance on the SCREADY English Language Arts.

HA1: There is a relationship between school location and South Carolina student performance on the SCREADY English Language Arts.

H02: There is no relationship between school location and South Carolina student performance on the SCPASS Science.

HA2: There is a relationship between school location and South Carolina student performance on the SCPASS Science.

H03: There is no relationship between per pupil school funding by district and South Carolina student performance on the SCREADY ELA.

HA3: There is a relationship between per pupil school funding by district and South Carolina student performance on the SCREADY ELA.

H04: There is no relationship between per pupil school funding by district and South Carolina student performance on the SCPASS Science.

HA4: There is a relationship between per pupil school funding by district and South Carolina student performance academic performance on the SCPASS Science.

H05: There are no differences in mean average test scores between South Carolina rural students and urban students on the SC PASS Science.

HA5: There are differences in mean average test scores between South Carolina rural students and urban students on the SC PASS Science.

An ANOVA test can either provide conclusive evidence of a difference or indifference of mean average test score between the two sample categories based on the results. Utilizing the ANOVA output to evaluate the significance of the results helps reasonably assure that the difference or indifference in mean average test score data is due to a factor of interest instead of chance. With these statistical results, one can feel confident that the results are authentic and not the result of choosing a lucky sample. The following section covers the data analyses of this research project.

DATA ANALYSIS

This section discusses the data analyses of this research project. This research project uses descriptive statistics, analysis of variance (ANOVA), regression analysis, PivotTable analysis, PivotChart analysis, and Microsoft Power BI to analyze the datasets. Descriptive statistics such as mean, median, mode, standard deviation, and variance provide data interpretation for further use. The Microsoft Power BI tool is also used to provide a visual context to the research results. This data visualization component allows the readers to better detect patterns, trends, and outliers discovered in the dataset.

As discussed, the test score assessment datasets are derived from secondary data sources, as collected by the South Carolina Department of Education. Towards the end of this research project, the Power BI dashboard will include information that highlights the results on school funding, report card score information, and test score information. The Power BI dashboard will consist of charts, graphs, and tables that will highlight the discrepancies amongst K-12 schools in these different areas as well. The following section discusses population size and school district size.

Population Size and School District Size Summary

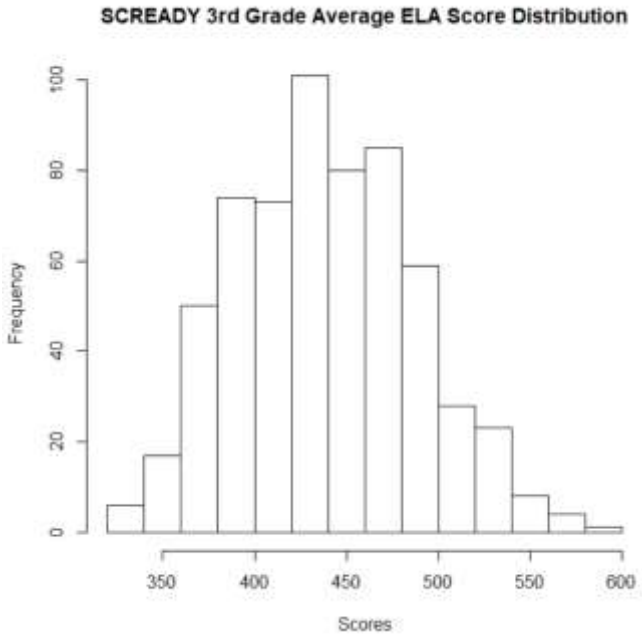
As of July 1, 2018, the annual estimate for the population in South Carolina aggregated by county was 5,021,268. As of July 1, 2019 annual estimates for population in South Carolina aggregated by county were 5,148,714 (U.S. Census Bureau, 2020). For the 2018-2019 calendar school year South Carolina reported a total of 781,493 actively enrolled students. That number is reduced to when students from SC public school charter districts, the Charter Institute at Erskine, the school of 751,138 deaf and blind, the Department of Juvenile Justice, the Department of Corrections, and the Governor's school were left out of the analysis. Based on this study's definition of rural, there were 24 urban districts and 22 rural districts. The urban district totaled 646, 195 actively enrolled students and rural districts totaled 69, 267 actively enrolled students. The following section presents the results of the study.

RESULTS

This section presents the results of this research project. The result section covers the pivot table, regression analysis, Microsoft Power BI, and analysis of variance outcomes. The next section depicts graph and pivot table SCPASS Science tested for 4, 6, and 8 grades.

Descriptive statistics-ELA

Table 1. 3rd grade SCREADY ELA mean scores (Urban and Rural Combined)



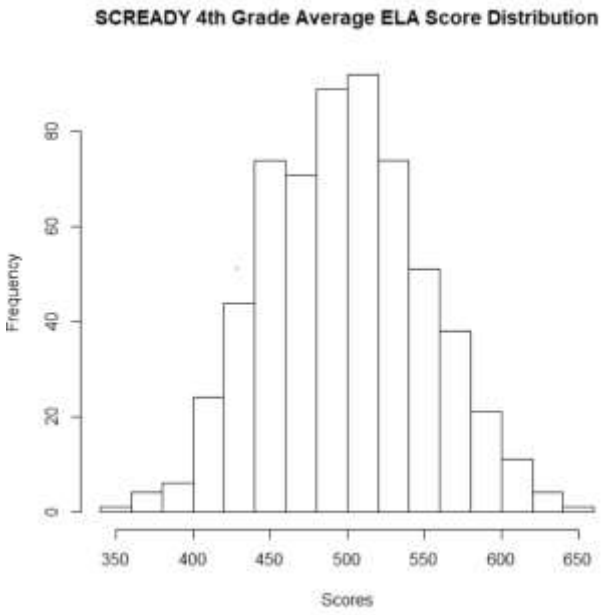
ELAMEAN-03 (Urban and Rural)	
Mean	438.8967159
Standard E	1.957450765
Median	434.5
Mode	445.9
Standard D	48.30582388
Sample Va	2333.452621
Kurtosis	-0.340577981
Skewness	0.210669293
Range	259.9
Minimum	322.4
Maximum	582.3
Sum	267288.1
Count	609
Largest(1)	582.3
Smallest(1	322.4
Confidence	3.844185476

Table 2. 3rd grade SCREADY ELA mean scores by location.

ELAMEAN(Rural)-03	
Mean	405.7728395
Standard Error	4.12914663
Median	402.1
Mode	386.4
Standard Deviation	37.16231967
Sample Variance	1381.038003
Kurtosis	-0.8457197
Skewness	0.271301733
Range	150.4
Minimum	332.6
Maximum	483
Sum	32867.6
Count	81
Confidence Level(95.0%)	8.217263669

ELAMEAN(Urban)-03	
Mean	497.8879
Standard Error	3.39822
Median	471.3
Mode	623.4
Standard Deviation	93.74406
Sample Variance	8787.949
Kurtosis	-0.66484
Skewness	0.547181
Range	494.8
Minimum	322.4
Maximum	817.2
Sum	378892.7
Count	761
Confidence Level(95.0%)	6.671012

Table 3. 4th grade SCREADY ELA mean scores (Urban and Rural Combined)



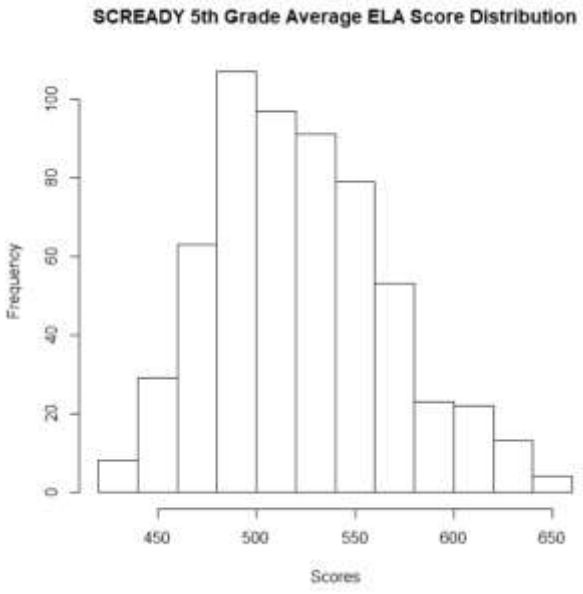
ELAMEAN-04 (Urban and Rural)	
Mean	498.4499174
Standard Error	2.084871431
Median	497.8
Mode	484.1
Standard Deviation	51.28105669
Sample Variance	2629.746776
Kurtosis	-0.361899827
Skewness	0.110918809
Range	286.3
Minimum	357.8
Maximum	644.1
Sum	301562.2
Count	605
Largest(1)	644.1
Smallest(1)	357.8
Confidence Level(95.0%)	4.094477616

Table 4. 4th grade SCREADY ELA mean scores by location.

ELAMEAN(Rural)-04	
Mean	464.5115385
Standard Error	4.424906794
Median	455.2
Mode	441.1
Standard Deviation	39.07971866
Sample Variance	1527.224411
Kurtosis	-0.842128283
Skewness	0.406810732
Range	154.8
Minimum	397.9
Maximum	552.7
Sum	36231.9
Count	78
Confidence Level(95.0%)	8.811115103

ELAMEAN(Urban)-04	
Mean	503.4731
Standard Error	2.221194
Median	502.5
Mode	484.1
Standard Deviation	50.99079
Sample Variance	2600.061
Kurtosis	-0.26181
Skewness	0.022011
Range	286.3
Minimum	357.8
Maximum	644.1
Sum	265330.3
Count	527
Confidence Level(95.0%)	4.3635

Table 5. 5th grade SCREADY ELA mean scores (Urban and Rural Combined)



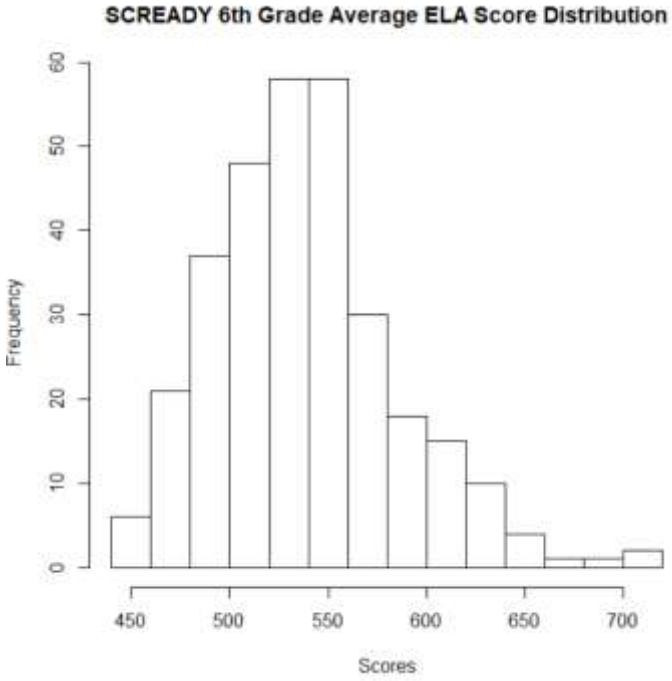
ELAMEAN-05 (Urban and Rural)	
Mean	522.5431239
Standard Error	1.838103855
Median	518.9
Mode	548.1
Standard Deviation	44.6095347
Sample Variance	1990.010586
Kurtosis	-0.176553011
Skewness	0.421615551
Range	228.4
Minimum	428.1
Maximum	656.5
Sum	307777.9
Count	589
Largest(1)	656.5
Smallest(1)	428.1
Confidence Level(95.0%)	3.610048169

Table 6. 5th grade SCREADY ELA mean scores by location.

ELAMEAN(Rural)-05	
Mean	489.7487
Standard Error	3.245563
Median	490.1
Mode	518.1
Standard Deviation	28.29416
Sample Variance	800.5596
Kurtosis	-0.4302
Skewness	0.225419
Range	126.2
Minimum	431.1
Maximum	557.3
Sum	37220.9
Count	76
Confidence Level(95.0%)	6.465493

ELAMEAN(Urban)-05	
Mean	527.4016
Standard Error	1.967
Median	523.4
Mode	548.1
Standard Deviation	44.55157
Sample Variance	1984.842
Kurtosis	-0.23061
Skewness	0.338747
Range	228.4
Minimum	428.1
Maximum	656.5
Sum	270557
Count	513
Confidence Level(95.0%)	3.864383

Table 7. 6th grade SCREADY ELA mean scores (Urban and Rural Combined)



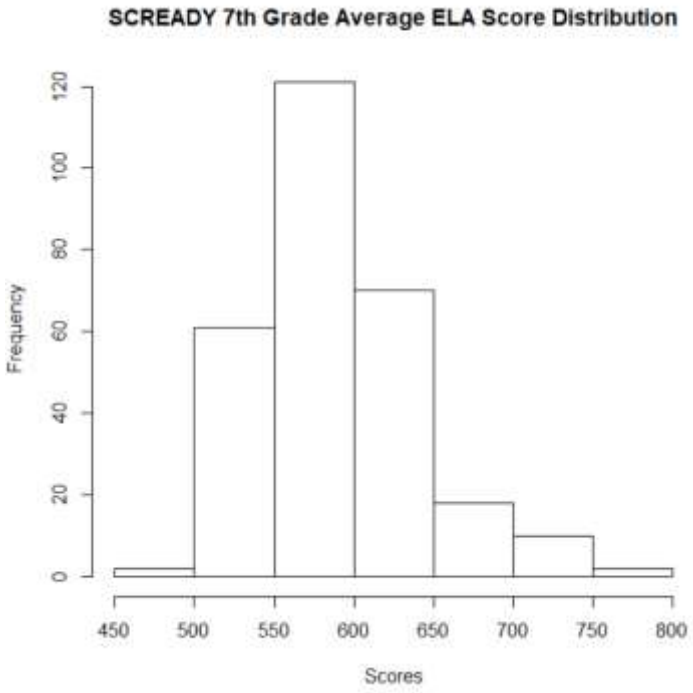
ELAMEAN-06 (Urban and Rural)	
Mean	538.4970874
Standard Error	2.624895935
Median	533.9
Mode	512.5
Standard Deviation	46.14145977
Sample Variance	2129.03431
Kurtosis	0.813855573
Skewness	0.717590317
Range	260.5
Minimum	447.6
Maximum	708.1
Sum	166395.6
Count	309
Largest(1)	708.1
Smallest(1)	447.6
Confidence Level(95.0%)	5.164997245

Table 8. 6th grade SCREADY ELA mean scores by location.

ELAMEAN(Rural)-06	
Mean	514.2894737
Standard Error	4.362851327
Median	516.7
Mode	507.8
Standard Deviation	32.93880519
Sample Variance	1084.964887
Kurtosis	-0.620323905
Skewness	0.195995082
Range	134.4
Minimum	452.8
Maximum	587.2
Sum	29314.5
Count	57
Confidence Level(95.0%)	8.739841429

ELAMEAN(Urban)-06	
Mean	543.9726
Standard Error	2.959567
Median	541.1
Mode	512.5
Standard Deviation	46.98167
Sample Variance	2207.278
Kurtosis	0.67947
Skewness	0.668871
Range	260.5
Minimum	447.6
Maximum	708.1
Sum	137081.1
Count	252
Confidence Level(95.0%)	5.82875

Table 9. 7th grade SCREADY ELA mean scores (Urban and Rural Combined)



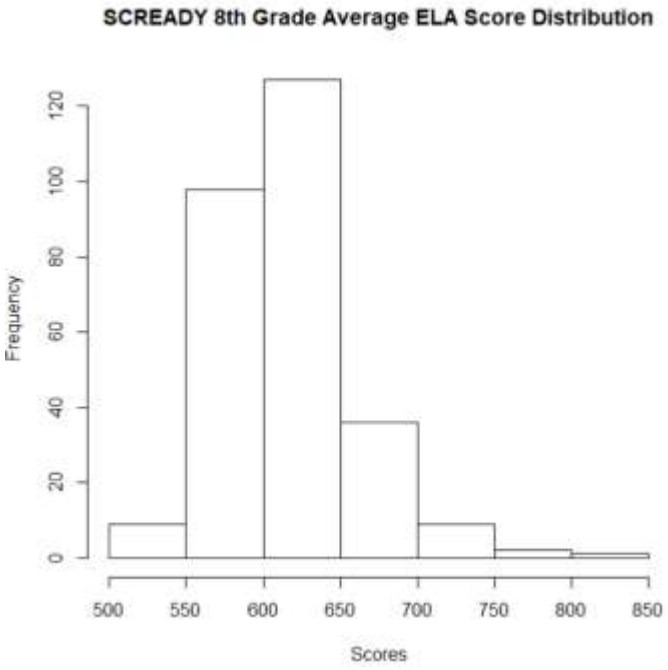
ELAMEAN-07 (Urban and Rural)	
Mean	588.672887
Standard Error	2.86001929
Median	582.6
Mode	580.4
Standard Deviation	48.1979019
Sample Variance	2323.03774
Kurtosis	1.21535265
Skewness	0.8910898
Range	285.4
Minimum	494.6
Maximum	780
Sum	167183.1
Count	284
Largest(1)	780
Smallest(1)	494.6
Confidence Level(95.(	5.62961028

Table 10. 7th grade SCREADY ELA mean scores location.

ELAMEAN(Rural)-07	
Mean	561.38
Standard Error	3.946418681
Median	553.05
Mode	#N/A
Standard Deviation	27.90539411
Sample Variance	778.7110204
Kurtosis	-0.01909868
Skewness	0.822943839
Range	102.9
Minimum	523.2
Maximum	626.1
Sum	28069
Count	50
Confidence Level(95.0%)	7.930625257

ELAMEAN(Urban)-07	
Mean	594.5047
Standard Error	3.244834
Median	588.7
Mode	580.4
Standard Deviation	49.63642
Sample Variance	2463.774
Kurtosis	0.985747
Skewness	0.752058
Range	285.4
Minimum	494.6
Maximum	780
Sum	139114.1
Count	234
Confidence Level(95.0%)	6.392965

Table 11. 8th grade SCREADY ELA mean scores (Urban and Rural Combined)



ELAMEAN-08 (Urban and Rural)	
Mean	615.377305
Standard Error	2.61876046
Median	611.7
Mode	623.4
Standard Deviation	43.97646632
Sample Variance	1933.92959
Kurtosis	1.741982257
Skewness	0.841115459
Range	296
Minimum	521.2
Maximum	817.2
Sum	173536.4
Count	282
Largest(1)	817.2
Smallest(1)	521.2
Confidence Level(95.0%)	5.154878318

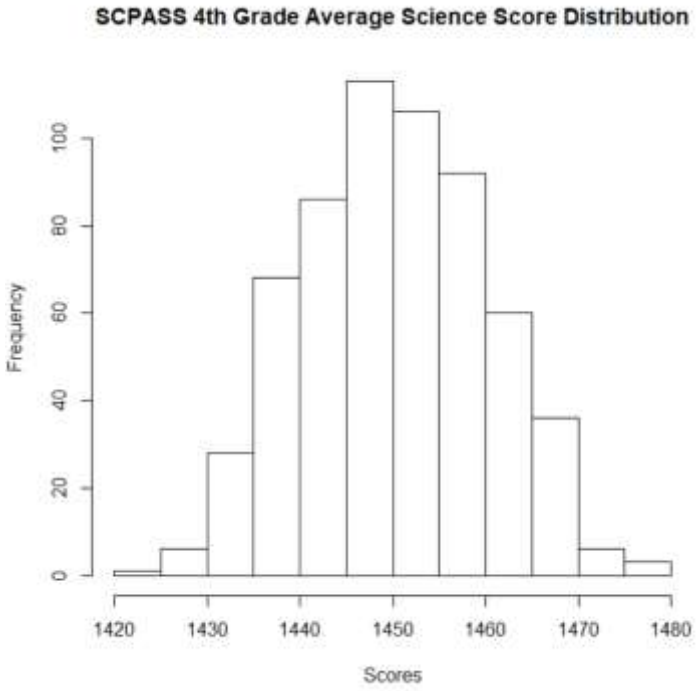
Table 12. 8th grade SCREADY ELA section mean scores by location.

ELAMEAN(Rural)-08	
Mean	593.1469
Standard Error	4.740945
Median	591.9
Mode	564.9
Standard Deviation	33.18661
Sample Variance	1101.351
Kurtosis	-0.14855
Skewness	0.440256
Range	145.5
Minimum	529.8
Maximum	675.3
Sum	29064.2
Count	49
Confidence Level(95.0%)	9.532308

ELAMEAN(Urban)-08	
Mean	620.0524
Standard Error	2.921135
Median	618.1
Mode	623.4
Standard Deviation	44.5892
Sample Variance	1988.197
Kurtosis	1.747363
Skewness	0.823348
Range	296
Minimum	521.2
Maximum	817.2
Sum	144472.2
Count	233
Confidence Level(95.0%)	5.755344

Descriptive statistics-Science

Table 13. 4th grade SCPASS Science mean scores (Urban and Rural Combined)



SciMEAN-04 (Urban and Rural)	
Mean	1450.209091
Standard Error	0.402239367
Median	1450.1
Mode	1451.8
Standard Deviation	9.893780239
Sample Variance	97.88688742
Kurtosis	-0.49166059
Skewness	0.04791112
Range	55.8
Minimum	1422.7
Maximum	1478.5
Sum	877376.5
Count	605
Largest(1)	1478.5
Smallest(1)	1422.7
Confidence Level(95.0%)	0.789957625

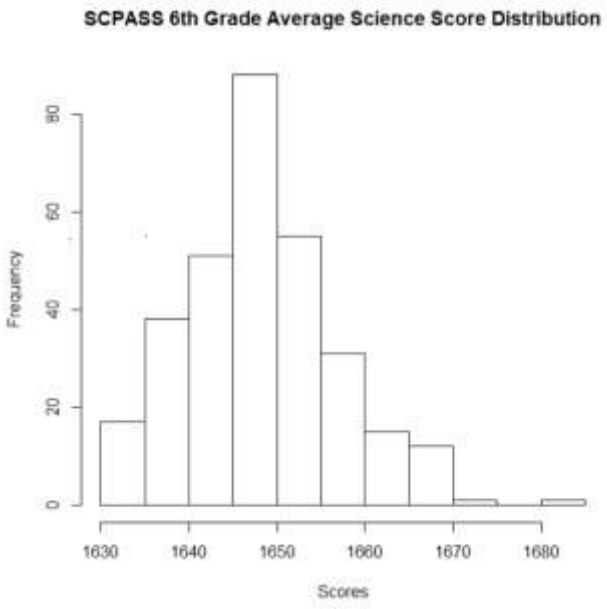
Table 14. 4th grade SCPASS Science mean scores by location.

SciMEAN(Rural)-04	
Mean	1444.559
Standard Error	0.985001
Median	1442.55
Mode	1441.3
Standard Deviation	8.699297
Sample Variance	75.67778
Kurtosis	-0.56734
Skewness	0.415704
Range	35.5
Minimum	1430.2
Maximum	1465.7
Sum	112675.6
Count	78
Confidence Level(95.0%)	1.961389

SciMEAN(Urban)-04	
Mean	1451.045
Standard Error	0.42656
Median	1451
Mode	1453.1
Standard Deviation	9.792319
Sample Variance	95.88952
Kurtosis	-0.40381
Skewness	-0.01342
Range	55.8
Minimum	1422.7
Maximum	1478.5
Sum	764700.9
Count	527
Confidence Level(95.0%)	0.837971

Table 15.

6th grade SCPASS Science mean scores (Urban and Rural Combined)



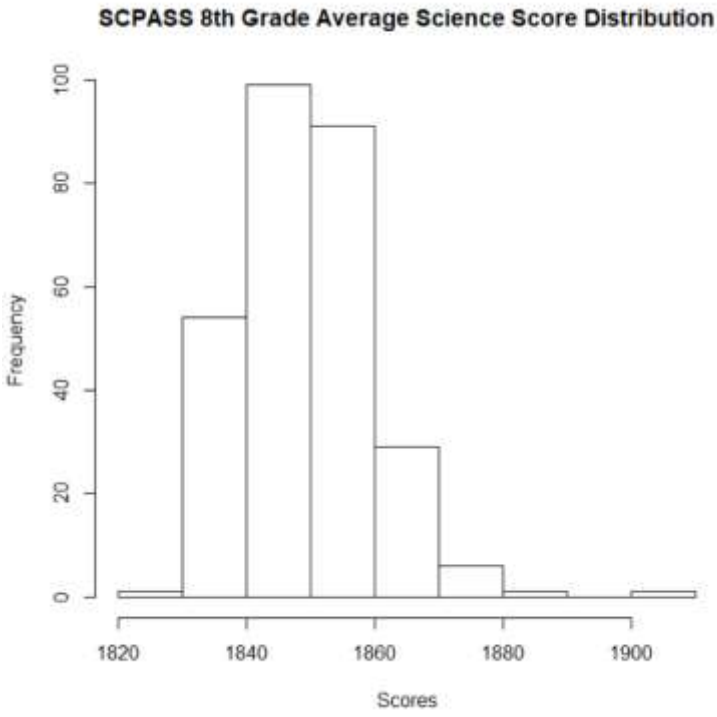
SciMEAN-06 (Urban and Rural)	
Mean	1648.099029
Standard Error	0.484156473
Median	1647.6
Mode	1646.8
Standard Deviation	8.510694134
Sample Variance	72.43191464
Kurtosis	0.532445049
Skewness	0.474181856
Range	51.2
Minimum	1630.7
Maximum	1681.9
Sum	509262.6
Count	309
Largest(1)	1681.9
Smallest(1)	1630.7
Confidence Level(95.0%)	0.952672758

Table 16. 6th grade SCPASS Science mean scores by location.

SciMEAN(Rural)-06	
Mean	1643.407018
Standard Error	0.958878377
Median	1643.5
Mode	1640.8
Standard Deviation	7.239372991
Sample Variance	52.4085213
Kurtosis	0.316016863
Skewness	0.517184692
Range	34.6
Minimum	1630.9
Maximum	1665.5
Sum	93674.2
Count	57
Confidence Level(95.0%)	1.92086421

SciMEAN(Urban)-06	
Mean	1649.160317
Standard Error	0.531012892
Median	1648.65
Mode	1648
Standard Deviation	8.429568329
Sample Variance	71.05762221
Kurtosis	0.627353608
Skewness	0.462329309
Range	51.2
Minimum	1630.7
Maximum	1681.9
Sum	415588.4
Count	252
Confidence Level(95.0%)	1.045808771

Table 17. 8th grade SCPASS Science section means scores (Urban and Rural Combined)



SciMEAN-08	
Mean	1849.445035
Standard Error	0.595181196
Median	1848.7
Mode	1845.4
Standard Deviation	9.994791891
Sample Variance	99.89586495
Kurtosis	2.436528159
Skewness	0.856951591
Range	73.6
Minimum	1829.6
Maximum	1903.2
Sum	521543.5
Count	282
Largest(1)	1903.2
Smallest(1)	1829.6
Confidence Level(95.0%)	1.171579718

Table 18. 8th grade SCPASS Science mean scores by location.

SciMEAN(Rural)-08	
Mean	1843.084
Standard Error	1.016812
Median	1842.4
Mode	1846.3
Standard Deviation	7.117682
Sample Variance	50.66139
Kurtosis	0.458859
Skewness	0.690618
Range	33.2
Minimum	1830.2
Maximum	1863.4
Sum	90311.1
Count	49
Confidence Level(95.0%)	2.044437

SciMEAN(Urban)-08	
Mean	1850.783
Standard Error	0.655674
Median	1850.3
Mode	1848
Standard Deviation	10.00843
Sample Variance	100.1686
Kurtosis	2.671856
Skewness	0.834608
Range	73.6
Minimum	1829.6
Maximum	1903.2
Sum	431232.4
Count	233
Confidence Level(95.0%)	1.291836

Regression Output-ELA

Regression 1. 3rd Grade SCREADY Mean ELA Scores and School Location

Regression Statistics	
Multiple R	0.268796783
R Square	0.072251711
Adjusted R Square	0.070723295
Standard Error	46.56633078
Observations	609

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	102506.3337	102506.334	47.27229234	1.53843E-11
Residual	607	1316232.86	2168.42316		
Total	608	1418739.193			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*
Intercept	405.7728395	5.174036754	78.4248081	0	395.611653
UrbanDummyVariable	38.20538019	5.556754303	6.87548488	1.53843E-11	27.2925824

Regression 2. 4th Grade SCREADY Mean ELA Scores and School Location

Regression Statistics	
Multiple R	0.254821073
R Square	0.064933779
Adjusted R Square	0.063383089
Standard Error	49.62927868
Observations	605

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	103138.6755	103138.7	41.87411	2.0163E-10
Residual	603	1485228.377	2463.065		
Total	604	1588367.052			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	464.5115385	5.619409247	82.66199	0	453.4755476	475.54753
UrbanDummyVariable	38.96151657	6.020922561	6.471021	2.02E-10	27.13699139	50.786042

Regression 3. 5th Grade SCREADY Mean ELA Scores and School Location

Regression Statistics	
Multiple R	0.283197634
R Square	0.0802009
Adjusted R Square	0.078633951
Standard Error	42.81971733
Observations	589

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	93845.18	93845.18	51.18284	2.51858E-12
Residual	587	1076281	1833.528		
Total	588	1170126			

	Coefficients	*andard Erro*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	489.7486842	4.911758	99.70944	0	480.1019242	499.3954443
UrbanDummyVariable	37.65287524	5.263031	7.154218	2.52E-12	27.31621025	47.98954024

Regression 4. 6th Grade SCREADY Mean ELA Scores and School Location

Regression Statistics	
Multiple R	0.24992039
R Square	0.0624602
Adjusted R Square	0.05940633
Standard Error	44.7499297
Observations	309

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	40957.81262	40957.81	20.45277	8.74231E-06
Residual	307	614784.7548	2002.556		
Total	308	655742.5674			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	514.289474	5.927272981	86.76663	5.1E-218	502.6262525	525.95269
UrbanDummyVariable	29.6831454	6.563475954	4.522473	8.74E-06	16.76805401	42.598237

Regression 5. 7th Grade SCREADY Mean ELA Scores and School Location

Regression Statistics	
Multiple R	0.262219
R Square	0.068759
Adjusted R	0.065457
Standard E	46.59377
Observatio	284

ANOVA

	df	*SS*	*MS*	*F*	*ignificance F*
Regression	1	45203.44	45203.44	20.82168	7.53E-06
Residual	282	612216.2	2170.98		
Total	283	657419.7			

	Coefficients	*tandard Erro*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*ower 95.0%*	*pper 95.0%*
Intercept	561.38	6.589354	85.19499	2.9E-203	548.4094	574.3506	548.4094	574.3506
UrbanDum	33.1247	7.259289	4.563078	7.53E-06	18.83543	47.41397	18.83543	47.41397

Regression 6. 8th Grade SCREADY Mean ELA Scores and School Location

Regression Statistics	
Multiple R	0.2322297
R Square	0.053930634
Adjusted R Square	0.050551814
Standard Error	42.85050688
Observations	282

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	29307.75151	29307.75	15.96139	8.2704E-05
Residual	280	514126.4632	1836.166		
Total	281	543434.2148			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	593.1469388	6.121500983	96.89567	2.2E-217	581.096932	605.196945
UrbanDummyVariable	26.90542174	6.734486974	3.99517	8.27E-05	13.6487693	40.1620741

Regression 7. 8th Grade SCREADY Mean ELA Scores and District School Funding (Rev Per Pupil)

Regression Statistics	
Multiple R	0.129610893
R Square	0.016798984
Adjusted R Square	0.013287551
Standard Error	43.68331948
Observations	282

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	9129.14246	9129.142	4.784083	0.029551051
Residual	280	534305.0723	1908.232		
Total	281	543434.2148			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	647.7245546	15.01600776	43.1356	1.1E-125	618.1659563	677.283153
Rev Per Pupil	-0.002248951	0.001028207	-2.18725	0.029551	-0.004272948	-0.000224953

Regression 8. 8th Grade SCREADY Mean ELA Scores, School Location, and School Funding (Rev Per Pupil)

Regression Statistics	
Multiple R	0.255098614
R Square	0.065075303
Adjusted R Square	0.058373334
Standard Error	42.67364142
Observations	282

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	2	35364.14619	17682.07	9.709878	8.38186E-05
Residual	279	508070.0686	1821.04		
Total	281	543434.2148			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	620.7216202	16.30307964	38.07389	1.7E-112	588.628957	652.8142835
UrbanDummyVariable	25.60042763	6.744757788	3.795604	0.000181	12.32335083	38.87750442
Rev Per Pupil	-0.001842172	0.001010143	-1.82367	0.069271	-0.003830641	0.000146297

Regression Output-Science

Regression 9. 4th Grade SCPASS Mean Science Scores and School Location

Regression Statistics	
Multiple R	0.103683319
R Square	0.010750231
Adjusted R Square	0.009109684
Standard Error	9.848612533
Observations	605

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	635.5931993	635.5932	6.552834	0.010714367
Residual	603	58488.0868	96.99517		
Total	604	59123.68			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	1447.544872	1.115135779	1298.088	0	1445.35485	1449.734894
UrbanDummyVariable	3.058543765	1.194813525	2.55985	0.010714	0.712042466	5.405045064

Regression 10. 6th Grade SCPASS Mean Science Scores and School Location

Regression Statistics	
Multiple R	0.11416
R Square	0.013033
Adjusted R Square	0.009818
Standard Error	8.468814
Observations	309

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	290.7427559	290.7428	4.053813	0.044944107
Residual	307	22018.28695	71.7208		
Total	308	22309.02971			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	1650.139	1.121721769	1471.077	0	1647.931361	1652.346
UrbanDummyVariable	-2.5009	1.24212161	-2.01341	0.044944	-4.945047212	-0.05675

Regression 11. 8th Grade SCPASS Mean Science Scores and School Location

Regression Statistics	
Multiple R	0.002432585
R Square	5.91747E-06
Adjusted R Square	-0.00356549
Standard Error	10.0125942
Observations	282

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.166107804	0.166108	0.001657	0.967560036
Residual	280	28070.57194	100.252		
Total	281	28070.73805			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	1849.497959	1.4303706	1293.02	0	1846.682314	1852.313604
UrbanDummyVariable	-0.064053604	1.573602978	-0.04071	0.96756	-3.161647791	3.033540583

Regression 12. 8th Grade SCPASS Mean Science Scores and School Funding (Rev Per Pupil)

Regression Statistics	
Multiple R	0.19329933
R Square	0.037364631
Adjusted R Square	0.033926648
Standard Error	9.823784054
Observations	282

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	1048.852768	1048.853	10.86818	0.001104525
Residual	280	27021.88528	96.50673		
Total	281	28070.73805			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	1860.495783	3.402734635	546.7649	0	1853.797594	1867.193973
Rev Per Puipl	-0.00076979	0.000233504	-3.29669	0.001105	-0.001229436	-0.000310144

Regression 13. 8th Grade SCPASS Mean Science Scores, School Location, and School Funding (Rev Per Pupil)

Regression Statistics	
Multiple R	0.33802827
R Square	0.114263112
Adjusted R Square	0.107913743
Standard Error	9.440112723
Observations	282

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	2	3207.449875	1603.725	17.99598	4.45667E-08
Residual	279	24863.28817	89.11573		
Total	281	28070.73805			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	1853.121326	3.596802597	515.2135	0	1846.041008	1860.201643
UrbanDummyVariable	7.327159162	1.488767948	4.921626	1.47E-06	4.396514801	10.25780352
Rev Per Puipl	-0.000677808	0.000225161	-3.01032	0.002849	-0.001121038	-0.000234577

ANOVA Output-Science

ANOVA Table 1. Comparison of mean average test scores between 4th grade urban and rural students.

Anova: Single Factor				
SUMMARY				
Groups	*Count*	*Sum*	*Average*	*Variance*
SciMEAN(Rural)-04	78	112675.6	1444.55897	75.6777756
SciMEAN(Urban)-04	527	764700.9	1451.04535	95.8895173

ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	2858.60517	1	2858.60517	30.6360371	4.6475E-08	3.85692628
Within Groups	56265.0748	603	93.3085818			
Total	59123.68	604				

ANOVA Table 2. Comparison of mean average test scores between 6th grade urban and rural students.

Anova: Single Factor						
SUMMARY						
Groups	*Count*	*Sum*	*Average*	*Variance*		
SciMEAN(Rural)-06	57	93674.2	1643.40702	52.4085213		
SciMEAN(Urban)-06	252	415588.4	1649.16032	71.05762221		
ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	1538.68934	1	1538.68934	22.74289296	2.86574E-06	3.87192707
Within Groups	20770.3404	307	67.6558318			
Total	22309.0297	308				

ANOVA Table 3. Comparison of mean average test scores between 8th grade rural and urban students.

Anova: Single Factor				
SUMMARY				
Groups	*Count*	*Sum*	*Average*	*Variance*
SciMEAN(Rural)-08	49	90311.1	1843.08367	50.6613946
SciMEAN(Urban)-08	233	431232.4	1850.78283	100.168583

ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	2399.87978	1	2399.87978	26.1762319	5.7939E-07	3.87488398
Within Groups	25670.8583	280	91.6816367			
Total	28070.738	281				

The following section will present the result of an ANOVA test comparison amongst Chesterfield 01 School District (rural) and Georgetown 01 School District (urban). Summary statistics for the mean averages for grades 4, 6, and 8 are presented as well.

Chesterfield 01 and Georgetown 01 SCPASS Science mean average scores.

Chesterfield 01(SciMean-04)	Georgetown 01(SciMean-04)	Chesterfield 01(SciMean-06)	Georgetown 01(SciMean-06)
1464.7	1437.9	1649.8	1654.5
1458.7	1448.4	1643.8	1638.7
1457.1	1446.8	1639.8	1641.2
1451.8	1446.7	1636.5	1657.6
1448.3	1443		1641.2
1437.6	1440.1		
1441.3	1448.8		
	1436.2		
	1460.8		

Chesterfield 01(SciMean-08)	Georgetown 01(SciMean-08)
1846.7	1849.7
1838	1839
1844.6	1842.5
1838.3	1864.1
	1843.3

Chesterfield 01 and Georgetown 01 SCPASS Science mean average scores.

Chesterfieild 01(SciMean-04)	
Mean	1451.357143
Standard Error	3.667349967
Median	1451.8
Mode	#N/A
Standard Deviation	9.702895984
Sample Variance	94.14619048
Kurtosis	-1.091777949
Skewness	-0.175895888
Range	27.1
Minimum	1437.6
Maximum	1464.7
Sum	10159.5
Count	7
Largest(1)	1464.7
Smallest(1)	1437.6
Confidence Level(95.0%)	8.973682097

Georgetown 01(SciMean-04)	
Mean	1445.411111
Standard Error	2.461111111
Median	1446.7
Mode	#N/A
Standard Deviation	7.383333333
Sample Variance	54.51361111
Kurtosis	1.513749061
Skewness	0.93663635
Range	24.6
Minimum	1436.2
Maximum	1460.8
Sum	13008.7
Count	9
Largest(1)	1460.8
Smallest(1)	1436.2
Confidence Level(95.0%)	5.675332399

Chesterfieild 01(SciMean-06)	
Mean	1642.475
Standard Error	2.861635605
Median	1641.8
Mode	#N/A
Standard Deviation	5.723271209
Sample Variance	32.75583333
Kurtosis	-0.427731902
Skewness	0.579295087
Range	13.3
Minimum	1636.5
Maximum	1649.8
Sum	6569.9
Count	4
Largest(1)	1649.8
Smallest(1)	1636.5
Confidence Level(95.0%)	9.107001657

Georgetown 01(SciMean-06)	
Mean	1646.64
Standard Error	3.899564078
Median	1641.2
Mode	1641.2
Standard Deviation	8.719690361
Sample Variance	76.033
Kurtosis	-2.816661321
Skewness	0.61563547
Range	18.9
Minimum	1638.7
Maximum	1657.6
Sum	8233.2
Count	5
Largest(1)	1657.6
Smallest(1)	1638.7
Confidence Level(95.0%)	10.8269256

Chesterfieild 01(SciMean-08)	
Mean	1841.9
Standard Error	2.207940217
Median	1841.45
Mode	#N/A
Standard Deviation	4.415880433
Sample Variance	19.5
Kurtosis	-4.880307692
Skewness	0.188132184
Range	8.7
Minimum	1838
Maximum	1846.7
Sum	7367.6
Count	4
Largest(1)	1846.7
Smallest(1)	1838
Confidence Level(95.0%)	7.026651185

Georgetown 01(SciMean-08)	
Mean	1847.72
Standard Error	4.444367222
Median	1843.3
Mode	#N/A
Standard Deviation	9.937907224
Sample Variance	98.762
Kurtosis	2.112409012
Skewness	1.490486696
Range	25.1
Minimum	1839
Maximum	1864.1
Sum	9238.6
Count	5
Largest(1)	1864.1
Smallest(1)	1839
Confidence Level(95.0%)	12.33954162

ANOVA Table 4. Mean average test scores between Chesterfield 01 School District and Georgetown 01 School District. (Grade 04)

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
Chesterfield 01 (Grade 04)	7	10159.5	1451.357	94.14619
Georgetown 01 (Grade 04)	9	13008.7	1445.411	54.51361

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	139.2115	1	139.2115	1.947041	0.184647	4.60011
Within Groups	1000.986	14	71.499			
Total	1140.198	15				

ANOVA Table 5. Mean average test scores between Chesterfield 01 School District and Georgetown 01 School District. (Grade 06)

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Chesterfield 01 (Grade 06)	4	6569.9	1642.475	32.75583
Georgetown 01 (Grade 06)	5	8233.2	1646.64	76.033

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	38.54938889	1	38.54939	0.670592	0.43983	5.591448
Within Groups	402.3995	7	57.48564			
Total	440.9488889	8				

ANOVA Table 6. Mean average test scores between Chesterfield 01 School District and Georgetown 01 School District. (Grade 08)

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Chesterfield 01 (Grade 08)	4	7367.6	1841.9	19.5
Georgetown 01 (Grade 08)	5	9238.6	1847.72	98.762

ANOVA

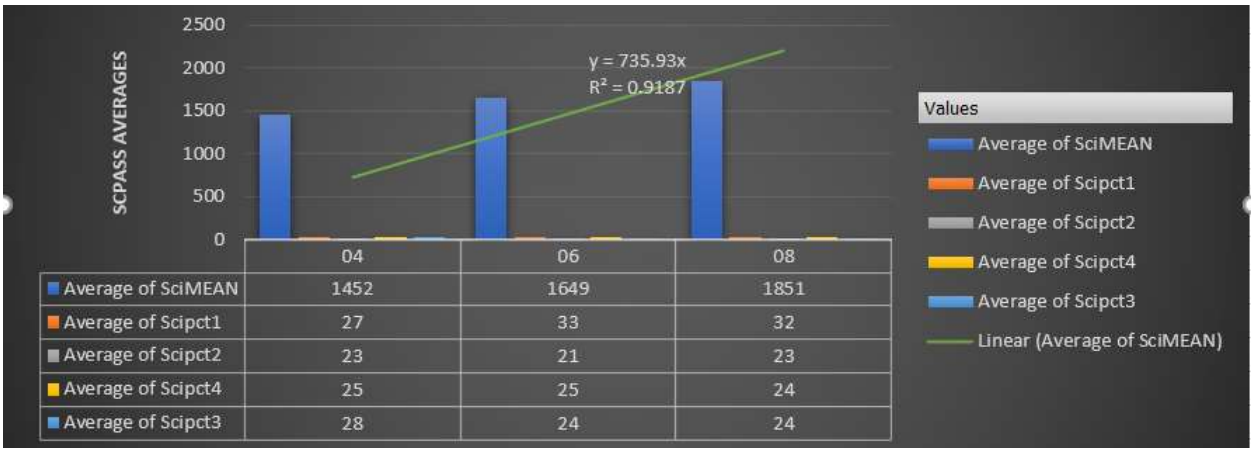
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	75.272	1	75.272	1.161738	0.316841	5.591448
Within Groups	453.548	7	64.79257			
Total	528.82	8				

PivotTable Analysis-Science

Displayed here are the definitions for terms used throughout the PivotTable Analysis Science section.

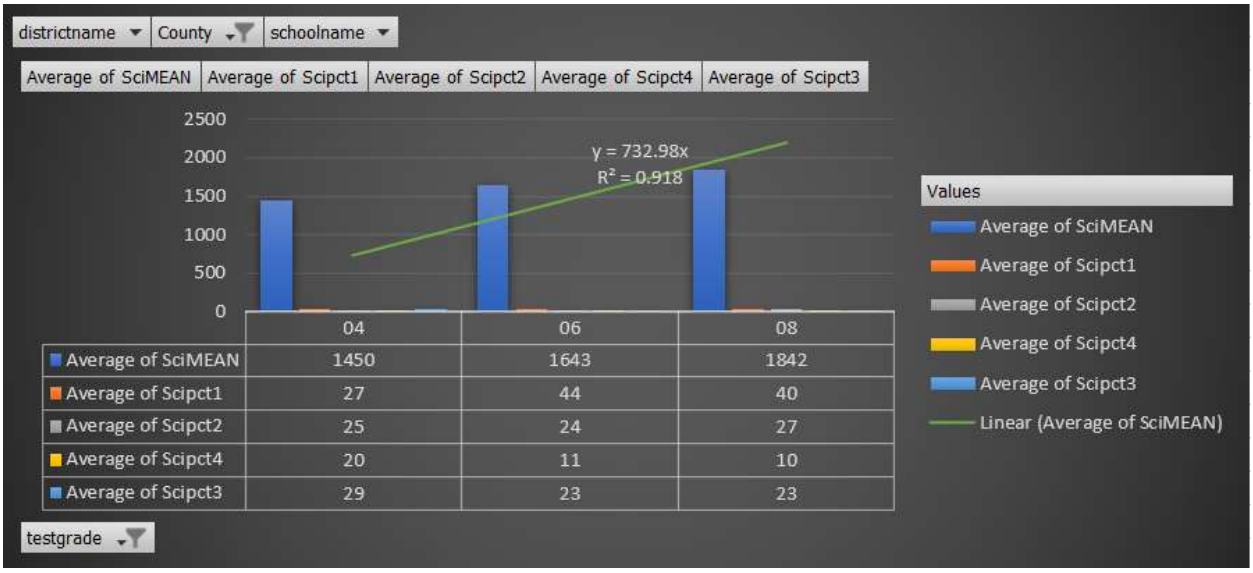
- SciMean- Science scale score means.
- Scipct1- Science % of test takers at does not meet expectations.
- Scipct2- Science % of test takers at approaches expectations.
- Scipct3- Science % of test takers at meets expectations.
- Scipct4- Science % of test takers at approaches expectations

PivotTable 1. SCPASS Science urban and rural district averages across 4th, 6th, & 8th grade.



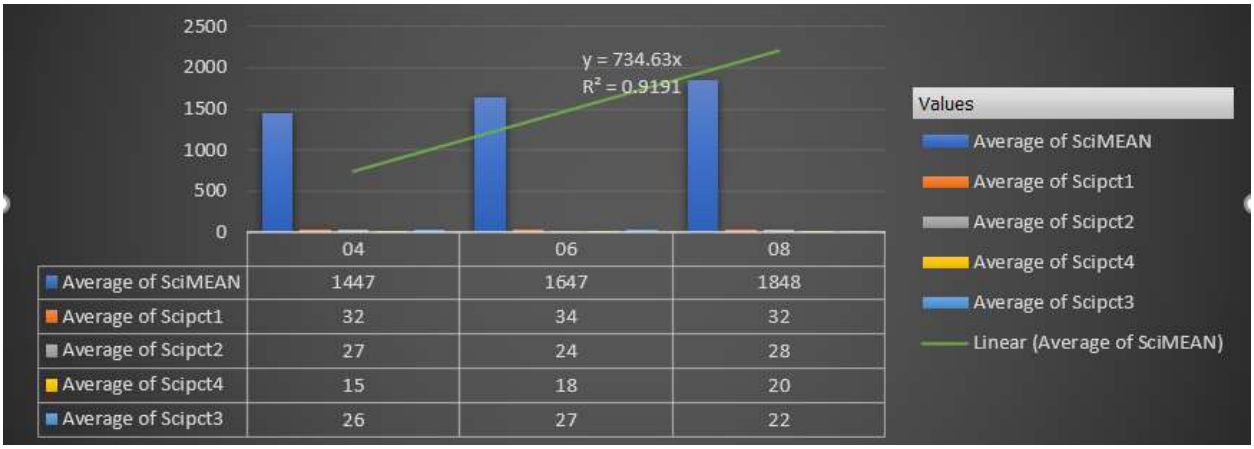
Row Labels	Average of SciMEAN	Average of Scipct1	Average of Scipct2	Average of Scipct4	Average of Scipct3
04	1452	27	23	25	28
06	1649	33	21	25	24
08	1851	32	23	24	24
Grand Total	**1610**	**30**	**23**	**25**	**26**

PivotTable 2. Chesterfield County SCPASS Science averages across 4th, 6th, & 8th grade.



Row Labels	Average of SciMEAN	Average of Scipct1	Average of Scipct2	Average of Scipct4	Average of Scipct3
04	1450	27	25	20	29
06	1643	44	24	11	23
08	1842	40	27	10	23
Grand Total	**1624**	**36**	**25**	**14**	**26**

PivotTable 2. Georgetown County SCPASS Science averages across 4th, 6th, & 8th grade.



Row Labels	Average of SciMEAN	Average of Scipct1	Average of Scipct2	Average of Scipct4	Average of Scipct3
04	1447	32	27	15	26
06	1647	34	24	18	27
08	1848	32	28	20	22
Grand Total	**1616**	**33**	**26**	**18**	**25**

Discussion

This section presents data interpretations and evaluations of the findings for the research project.

1) This research suggests that there is sufficient evidence of a relationship ($P<0.05$) between school location and South Carolina student performance on the SCREADY English Language Arts for 3rd, 4th, 5th, 6th, 7th, & 8th grade (Regression tables 1-6). Out of all possible factors causing variation in student performance on the SCREADY English Language Arts, approximately 5-8% of that variation was attributed to school location (Urban and Rural) for the 2018-2019 school year.

2) This research suggests that there is significant evidence of a relationship ($P<0.05$) between school location and South Carolina student performance on the SCPASS Science for 4th and 6th grade (Regression tables 9-10). Out of all possible factors causing variation in student performance on the SCPASS Science, approximately .09% of that variation was attributed to school location (Urban and Rural) for the 2018-2019 school year. This research also found that there is no significant evidence of a relationship ($P>0.05$) between school location (Urban and Rural) and South Carolina student performance on the SCPASS Science for 8th grade students for the 2018-2019 school year (Regression table 11).

3) This research suggests that there is significant evidence of a relationship ($P<0.05$) between per pupil funding by district and South Carolina student performance on the SCREADY English Language Arts for 8th grade students (Regression table 7). Out of all possible factors causing variation in student performance on the SCREADY English Language Arts, approximately 1% of that variation was attributed to per pupil funding by district for the 2018-2019 school year.

4) This research suggests that there is significant evidence of a relationship ($P<0.05$) between per pupil funding by district and South Carolina student performance on the SCPASS Science for 8th grade students (Regression table 12). Out of all possible factors causing variation in student performance on the SCREADY English Language Arts, approximately 3% of that variation was attributed to per pupil funding by district for the 2018-2019 school year.

5) This research suggests that there is significant evidence of a difference ($P<0.05$) in mean average test scores between rural and urban 4th, 6th, and 8th grade students who took the SCPASS Science for the 2018-2019 school year. (ANOVA tables 1-3). When looking at the two individual schools' districts of Chesterfield 01 (Rural) and Georgetown 01 (Urban), this research suggests that there is no significant evidence of a difference ($P>0.05$) in mean average test scores between these two districts for 4th, 6th, and 8th grade students who took the SCPASS Science for the 2018-2019 school year (ANOVA tables 4-6).

LIMITATIONS

This research project was subject to several limitations. First, the dataset containing South Carolina standardized assessments (SC READY and SC READY) only reflects a small percent of existing rural schools in the United States. Second, all data from the students were not self-reported. Third, we did not include parent's incomes, wages, and careers as a variable; therefore, they could not be factored into analyses to examine their impact on academic performance and achievement for the students. This project was also limited due to time. Ideally, one would compare all test scores for multiple core subjects across all years for which we have

historical score data reported for urban and rural schools. Fourth, there was difficulty accessing the score data for individual students. As a result, analysis was able to be performed based on average scores for an entire grade. Fifth, school districts and populations do not remain static. When looking at historical data, there are many districts that have consolidated or have been rezoned, further adding to the complexity of distinguishing which districts are truly urban or rural. Finally, rural schools are, and South Carolina schools are sparse in published research. There were only two relevant papers found referencing the *Corridor of Shame* specifically for this research. The following section discusses the recommendations of this study.

RECOMMENDATIONS

In this case, rural and urban K-12 classification concepts may help to support further research project design. The research project findings may help to recommend new education policy appropriations that may facilitate to reduce the education gaps and facilitate to alleviate social and economic status (SES) for some of the less fortunate districts. Other recommendation includes assisting in addressing issues such as the inequities within the education system and provide theoretical solutions that South Carolina Department of Education (SCDE) can implement to level the playing field for some of the less fortunate districts.

In addition, prior research shows that students from wealthier urban areas tend to earn higher scores on standardized assessments than students from poor rural areas because of access to better resources. Past studies show that the wealthier demographic in South Carolina tends to fall in more urban areas; therefore, there should be a significant difference in scores between those students from rural and those students from the urban areas. The next section presents the appendix section of this research project.

APPENDIX

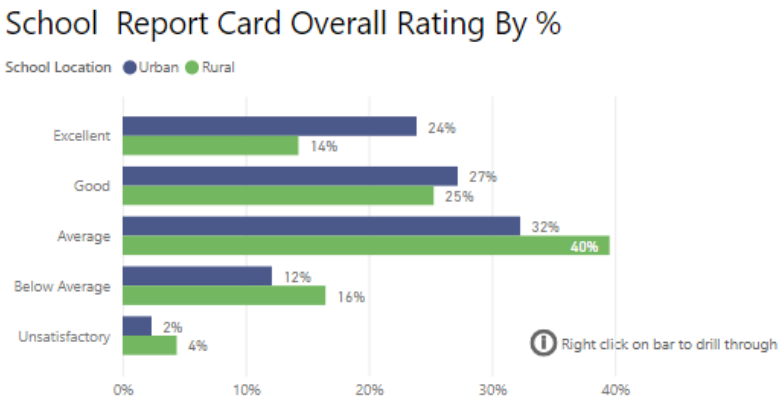
This section identifies the 8 school districts that were involved in the Abbeville County School Districts vs. The State of South Carolina court cased.

The 8 schools mentioned in the Abbeville County School District vs. South Carolina court case are as follows: Allendale County School District (Allendale); Dillon County School District 2 (Dillon 2); Florence County School District 4 (Florence 4); Hampton County School District 2 (Hampton 2); Jasper County School District (Jasper); Lee County School District (Lee); Marion County School District 7 (Marion 7); and Orangeburg County School District 3 (Orangeburg 3).

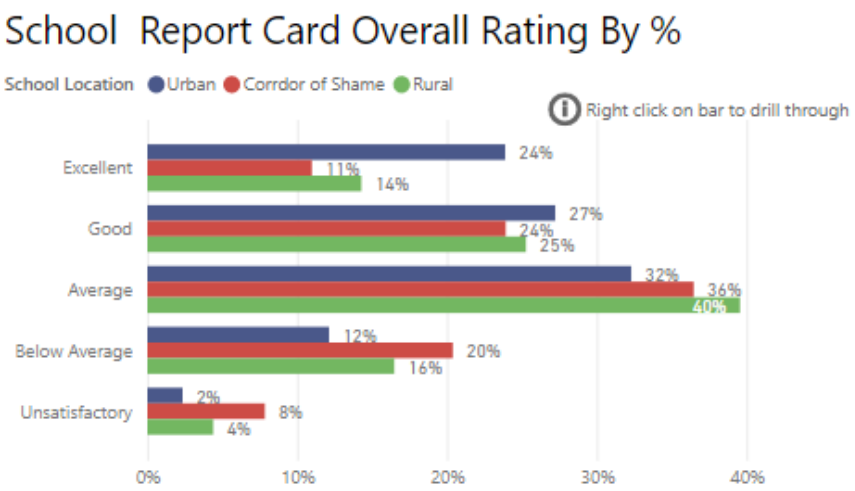
The next section includes a summary of the analysis and observations made from the Power BI dashboard portion of the research project.

Power BI Dashboard Output

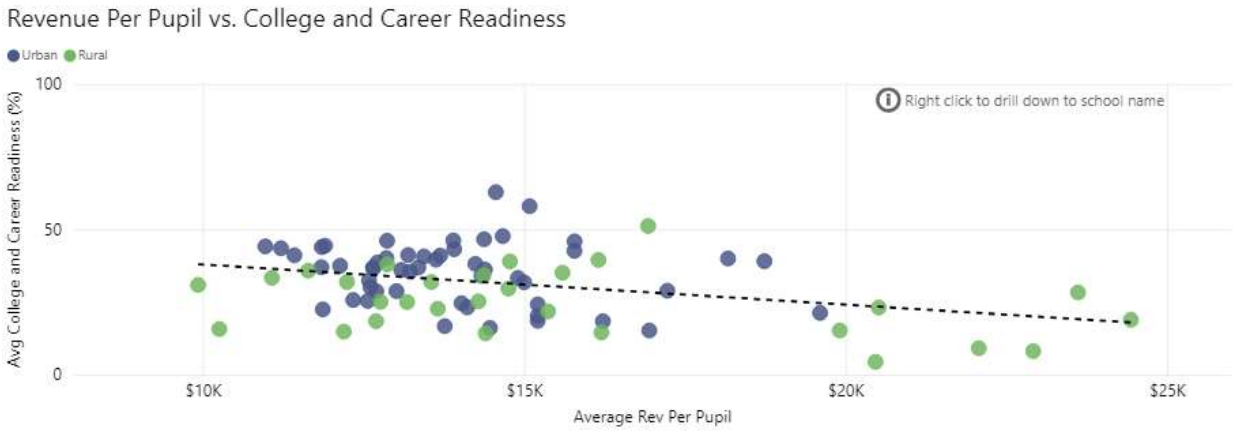
This section highlights findings from the use of Power BI to analyze 2018-2019 school report card data, student enrollment data, and revenue spent per pupil data. Each visualization graphic displays a comparison between urban and rural school districts. To capture the Corridor of Shame student performance (COS), a second graphic is presented with schools located in the COS as well in each section. The schools that fall in this COS category have been taken out of both the urban and rural groups to not be counted twice in the analysis.

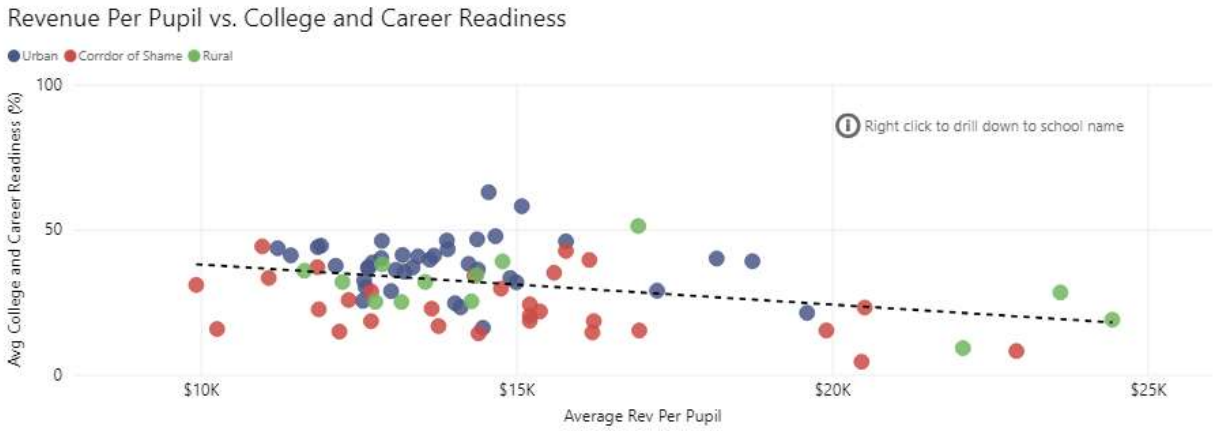


When looking at overall school report card ratings between urban and rural school districts, the most considerable discrepancy in the percentage of schools falls under the rating of excellent. Of all urban schools, 24% of them ranked excellent on their report card, while only 14% of all rural schools scored an excellent rating on their report cards. It is also worth noting in terms of ranking, the third-largest group of ratings for urban schools falls under the rating of excellent, while for rural schools, the third-largest group of ratings falls under the below average rating.



When the COS grouping is distinguished, the below average rating still ranks third for COS and rural schools among the overall rating distribution. For urban schools, the below average rating ranks 4th among the overall rating distribution.

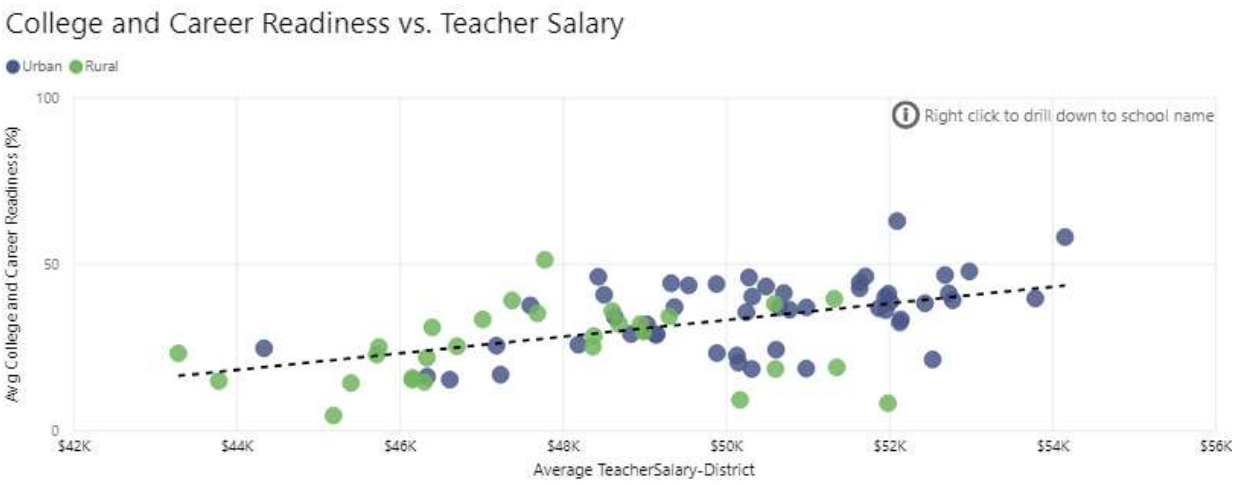


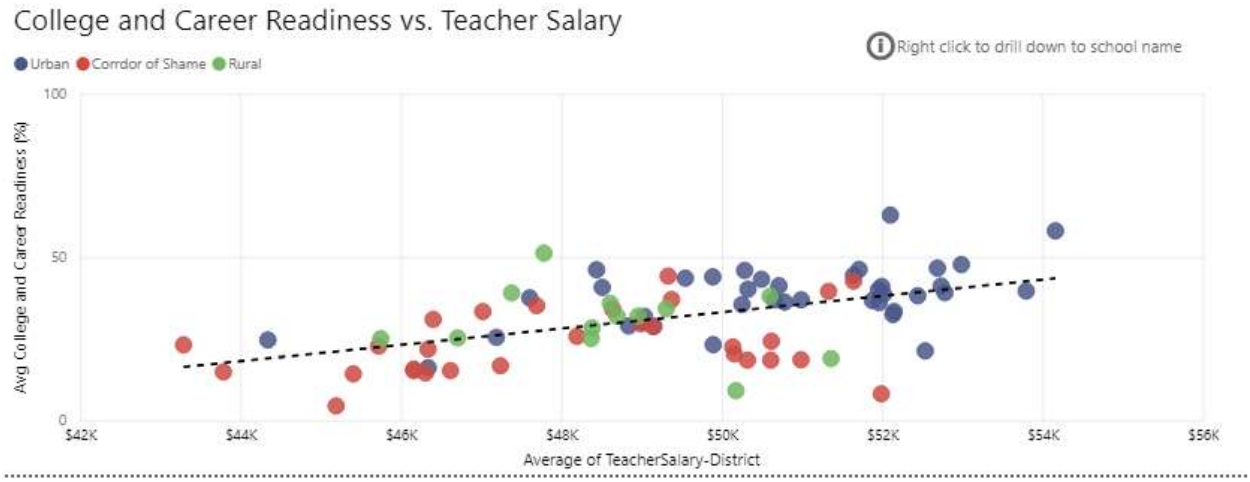


The scatter plots pictured here and on the next page choose the variables of revenue per pupil and teacher salary to evaluate possible relationships with the average college and career readiness of students. Even though the scatter plots are useful for recognizing patterns, it is crucial that one understand that correlation does not apply causation when exploring these scatterplot visualizations. Revenue per pupil is defined as the amount of funding that school districts receive to spend on students. These funds are spent on things such as facilities, textbooks, salaries for teachers.

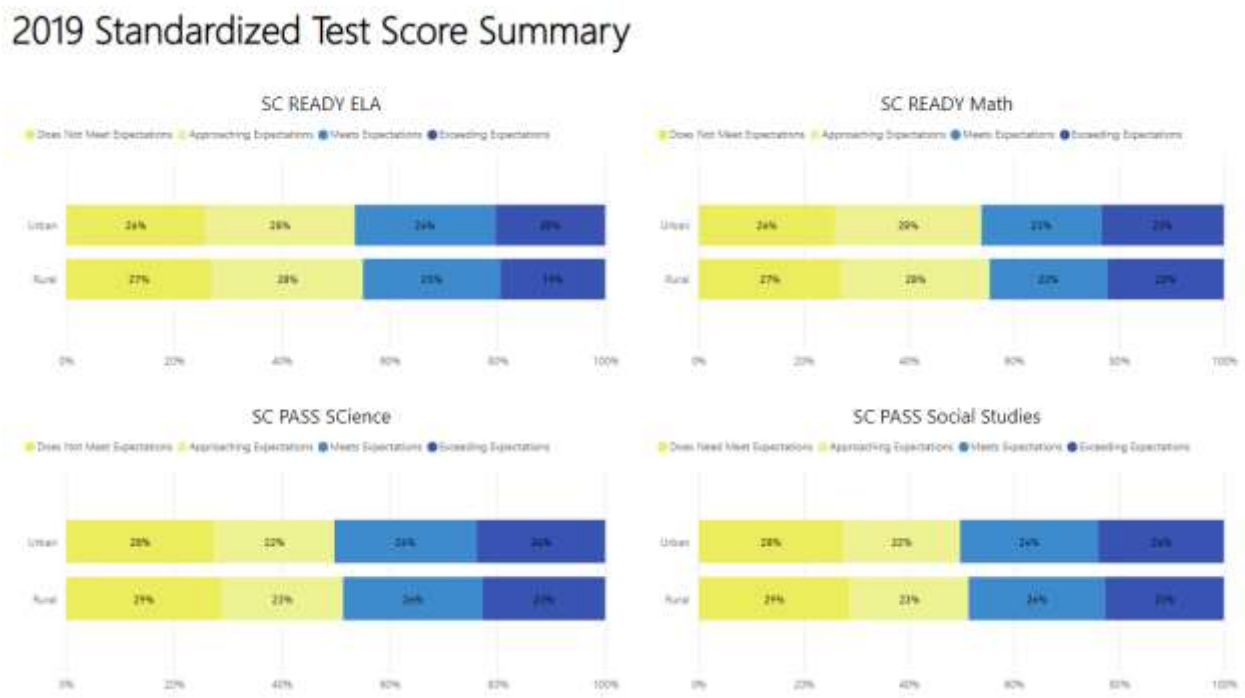
The scatterplot above comparing revenue per pupil to college and career readiness illustrates a negative relationship between the average college and career readiness of a student and the amount of funding the district receives. As funding increases, there is an observed

decrease in college and career readiness. Towards the right of the plot, the schools that are receiving the most funding are schools in the rural and *Corridor of Shame* locations. One of the reasons for the decline in college and career readiness as more funding is received may be because students in these less fortunate districts still do not have the same opportunities or resources to qualify as college and career ready despite receiving more funding per pupil.

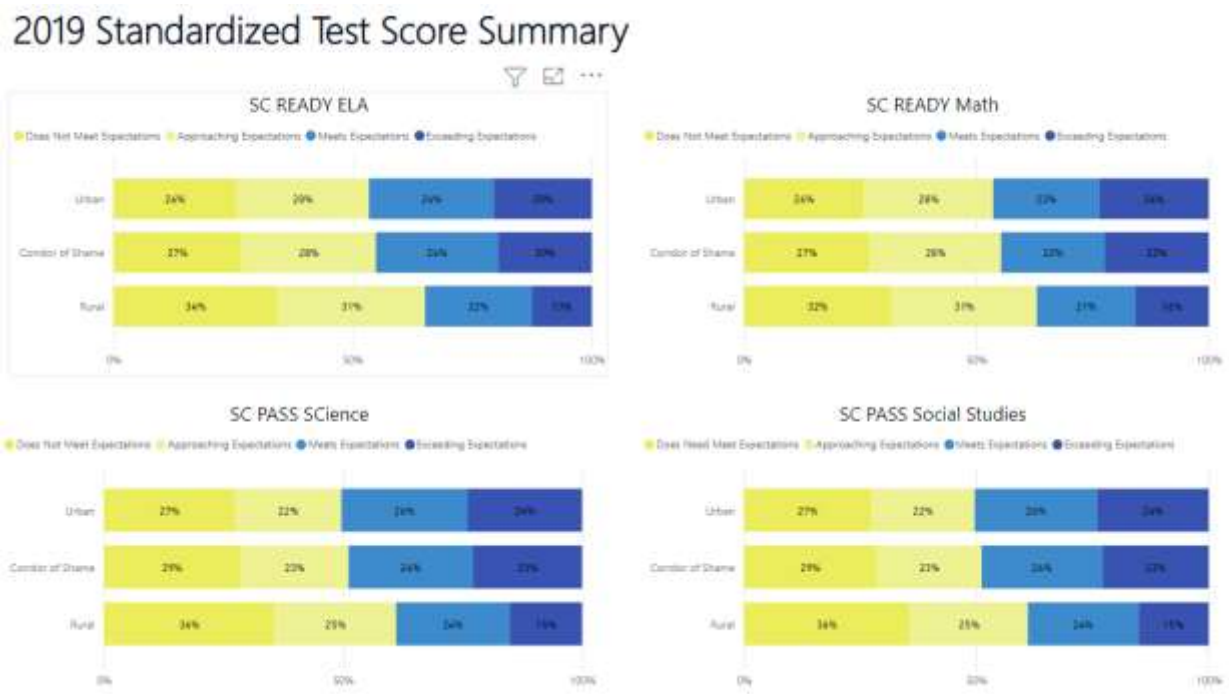




When observing average college and career readiness and average teacher salary by district, there is a positive correlation between the salary amounts teachers receive and average college and career readiness for students in those same associated districts. It is also worth noting that many of the districts with the highest relative average college and career readiness percentages fall into the urban category. Utilizing the regression line, one can see that rural and *Corridor of Shame* schools are behaving worse compared to many of their urban counterparts with almost identical teacher salaries. Due to funding having different correlations with average college and career readiness among students when looking at strictly revenue per pupil and teacher salary, there can be a conclusion made that there is much more than just school funding causing student average college and career readiness to increase or decrease.



Based on the 100% stacked bar chart for all four core areas (ELA, Math, Science, and Social Studies), Urban schools are outperforming rural schools for meeting and exceeding standards tested on the SCPASS and SCREADY except for Social Studies where both groups performed the same at 26% for meeting expectations.



When including schools located in the *Corridor of Shame* (COS) into the analysis, it is seen that this group of schools perform worse than urban schools but better than rural schools in relative percentage for students who did not meet expectations in all subject areas. Because the percentage of schools not meeting expectations increases extensively when COS schools are distinguished, it can be reasoned that a large portion of the COS is comprised of districts that were considered rural first before including the COS category.

The dashboard can further be accessed by contacting the author through email or either explored here:

https://app.powerbi.com/view?r=eyJrIjoiOTQwNThkYTMtZGQ3OC00ZTIxLWJhOWMtYmFjMWM5ZGVhMWIyIiwidCI6IjRiMmE0YjE5LWQxMzUtNDIwZS04YmIyLWIxY2QyMzg5OThjYyIsImMiOjF9&pageName=ReportSection

REFERENCES

Abbeville County School District, et al. v. the State of South Carolina, 24939 (Supreme Court of South Carolina April 22, 2014).

Akbiyik, C. (2017). *Thinking and Learning Demands in Contemporary Childhood.* Intech Open.

Arnold, M. L. (2005, April 27). A look at the condition of rural education research: Setting a direction for future research. Journal of Research in Rural Education,. *Journal of Research in Rural Education*, 20(6). Retrieved from http://www.keystone-institute.org/pdf/JRRE_05.pdf

Bakken. L., B. N. (2017). Early childhood education: The long-term benefits. *Journal of Research in Childhood Education*, 31(2), 255–269.

D.E., J., M., G., & M., C. (2015). Early Social-Emotional Functioning and Public Health: The Relationship Between Kindergarten Social Competence and Future Wellness. *Between Kindergarten Social Competence and Future Wellness. American Journal of Public Health,*, 105(11), 2283–2290. Retrieved from https://doi-org.pallas2.tcl.sc.edu/10.2105/AJPH.2015.302630

Daprile, L. (2020, April 6). *With third-world internet speeds, some SC rural residents struggle to learn online*. Retrieved from The State: https://www.ed.gov/essa?src=rn

Department of Education State of South Carolina. (2018). *S.C. Code Ann. Section 1.* Retrieved from https://ed.sc.gov/finance/financial-services/manual-handbooks-and-guidelines/funding-manuals/fiscal-year-2018-2019-funding-manual/

Education, S. C. (2020). *SC-Ready*. Retrieved from South Carolina Department of Education: https://ed.sc.gov/tests/middle/sc-ready/

Education, S. C. (n.d.). *South Carolina District and School Report Cards*. Retrieved from Home - SC School Report Card: screportcards.ed.sc.gov/

Ferillo, B. (Director). (2005). *Corridor of Shame: The Neglect of South Carolina's Rural Schools* [Motion Picture].

Fuson, K. C. (2019). *Narrowed Gaps and Persistent Challenges: Examining Rural-Nonrural Disparities in Postsecondary Outcomes over Time.* Phi Delta Kappan. Retrieved from https://doi.org/10.1086/705498

Kenyon, D. (2020, June 11). The Property Tax-School Funding Connection: South Carolina. *Lincoln Institute of Land Policy*. Retrieved from www.youtube.com/watch?v=CSJLH9hpiBo.

Lavalley, M. (2018). *Out of the Loop.* Center for Public Education & National School Boards Association.

Linda, B., Nola, B., & Barry, D. (2017).) Early Childhood Education: The Long-Term Benefits. *Journal of Research in Childhood Education, 31:2, 255-269,*. doi:DOI: 10.1080/02568543.2016.1273285

Mark Keierleber, G. A. (2018, March 17). *Getting Smart*. Retrieved from Gettingsmart.com: https://www.gettingsmart.com/2018/03/deep-in-south-carolinas-corridor-of-shame-teachers-at-new-tech-network-strive-for-a-big-turnaround/

Moore, T., & Lawrence, S. (2009). Creating greater opportunity in South Carolina's I-95 corridor: A human needs assessment (RTI Project Number 0211544.000.002). *RTI International*. Prepared for Francis Marion University, Florence, SC and South Carolina State University, Orangeburg, SC. Retrieved from http://www.scsu.edu/files/I95Corridor.pdf

Office of Assessment. (2019). *SCPASS Score Report User's Guide.* Retrieved from https://ed.sc.gov/tests/tests-files/scpass-files/scpass-spring-2019-score-report-users-guide/

Office of Assessment. (2019). *South Carolina College- and Career- Ready Assessments SCORE REPORT USER'S GUIDE.* South Carolina Department of Education. Retrieved from https://ed.sc.gov/tests/tests-files/sc-ready-files/sc-ready-spring-2019-score-report-users-guide/

Owens, A. (2018). Income Segregation between School Districts and Inequality in Students' Achievement. *Sociology of Education, 91(1), 1–27.* Retrieved from https://doi.org/10.1177/0038040717741180

Perna, R. R. (2017). *Pellinstitute.org*. Retrieved from Pellinstitute.org: http://pellinstitute.org/indicators/downloads/dialogues-2017_essays_Ruiz_Perna.pdf

Ramsey. K, &. B. (2013, 4 23). *Patrick Nhigula.* Retrieved from Patrick Nhigula: www.patricknhigula.com

Richard, A. (2019, February 21). *Many rural schools have been 'minimally adequate' for too long*. Retrieved from The Hechinger Report: https://hechingerreport.org/opinion-these-rural-schools-have-been-minimally-adequate-for-too-long/

SCDOE. (2020). *South Carolina College-and Career-Ready Assessments (SC READY)*. Retrieved from https://ed.sc.gov/tests/middle/sc-ready/

School of Medicine. (2020). *Tools & Resources*. Retrieved from University of South Carolina, South Carolina Center for Rural and Primary Healthcare,: https://sc.edu/study/colleges_schools/medicine/centers_and_institutes_new/center_for_rural_and_primary_healthcare/what_is_rural/index.php

Showalter, D., Johnson, J., Johnson, J., & Klein, B. (2017). *Why Rural Matters 2015-2016 Understanding the Changing Landscape.* Rural School and Community Trust.

Showalter, D., Johnson, J., Johnson, J., & Klein, B. (2019). *Why Rural Matters 2018-2019 The Time Is Now.* Rural School and Community Trust.

South Carolina Code of Laws Unannotated, Education Accountability Act, Article 1, Gerneral Provisions. (2017, June 10). Retrieved from South Carolina Legislature: https://www.scstatehouse.gov/code/t59c018.php

South Carolina Department of Education. (2014). *English Language Arts and Mathematics 2013-14 Operational Test Technical Report*. Retrieved from South Carolina High School Assessment Program: https://ed.sc.gov/tests/tests-files/assessment-information/2013-14-hsap-technical-report/

South Carolina Department of Education. (2017). *State Superintendent Molly Spearman Declares State of Emergency in the Allendale County School District*. Retrieved from http://ed.sc.gov/newsroom/news-releases/state-superintendent-molly-spearman-declares-state-of-emergency-in-the-allendale-county-school-district/

Stiefel, L. A. (2000). *Academic Performance, Characteristics and Expenditures in New York.* Condition Report prepared for the Education Finance Research.

Stiefel, L. A. (2001). *Determinants of School Performance in New York Elementary Schools:*. Condition Report prepared for the Education Finance Research.

Temoney, L. a. (2018). *"All Talk, But No Action: A Reexamination of Education in South Carolina's Corridor of Shame.* The Winthrop McNair Research Bulletin: Vol. 4 , Article 10. Retrieved from https://digitalcommons.winthrop.edu/wmrb/vol4/iss1/10

(2009). *Time to Act, a Comprehensive Report from Carnegie Corporation of New York, Demonstrates How to Re-Engineer Literacy Instruction Across the Curriculum to Drive Student Achievement in All Subjects.* NewsRX LLC.

Tran, T., Lutchers, S., & J.Fisher. (2016, July 31). Early childhood development: impact of national human development, family poverty, parenting practices and access to early childhood education. *Child: Care, Health & Development, 43(3), 415–426.* .

U.S. Department of Education. (2021). *Every Student Succeeds Act (ESSA)*. Retrieved from U.S. Department of Education: https://www.ed.gov/essa?src=rn

Wells, R. M. (2019). *). Narrowed Gaps and Persistent Challenges: Examining Rural-Nonrural Disparities in Postsecondary Outcomes over Time.* Retrieved from https://doi.org/10.1086/705498

Winthrop University. (2020). *Department of Political Science at Winthrop - Garvin, Kambrell*. Retrieved from Winthrop University: https://www.winthrop.edu/cas/politicalscience/my-political-science-experience-garvin-kambrell.aspx