Solving for X: How to Address Lagging Mathematics Proficiency in South Carolina Public Schools

PREPARED FOR

The nonprofit advocacy group SC for ED
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Dedication

To my family, I love you all dearly and certainly would not be where I am today without your steadfast encouragement and support throughout all of my academic endeavors. Your unwavering belief in the power of education has constantly inspired me to work as hard as I can in all that I have been free to choose to do. I am forever in your debt for always believing in me and making sacrifices on my behalf to ensure that my opportunities in life are limited only by my capacity for imagination. One day, I hope to be able to say that I played a role in making that a reality for **all** children in South Carolina. Dana and Shawn Burke, as well as Eugene Turner, I dedicate this report to you.

Disclaimer

The author conducted this study as part of the program of professional education at the Frank Batten School of Leadership and Public Policy, University of Virginia. This paper is submitted in partial fulfillment of the course requirements for the Master of Public Policy degree. The judgments and conclusions are solely those of the author, and are not necessarily endorsed by the Batten School, by the University of Virginia, or by any other agency.

Honor Pledge

On my Honor as a University of Virginia student, I have neither given nor received unauthorized aid on this assignment.

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Executive Summary

Mathematics proficiency rates among eighth grade public school students in South Carolina are too low, and they have been experiencing a further decline in recent years relative to the national average. Poor achievement in mathematics has significant impacts on students throughout their lives, ranging from an increased likelihood of dropping out in high school to higher rates of public assistance dependency and lifetimes of lower career earnings. SC for Ed is concerned with this issue because it provides clear evidence that something needs to change in education policy in South Carolina to ensure that students can reach their full potential and teachers can be the most effective educators possible.

This report offers a range of alternative policies to address this growing problem, including:

1. Maintain the Status Quo
2. Incentivize Class Size Reduction
3. Create an Education Scholarship Account (ESA) Program
4. Raise the Minimum Teacher Salary to $40,000
5. Incentivize Participation in Free Online Tutoring

Each of these policy alternatives are evaluated using criteria including cost-effectiveness, equity, political feasibility, and administrative feasibility. Equity receives the highest weighting at 0.4, while all other criteria receive a weight of 0.2. Following extensive research and evaluation on the criteria, the following analysis concludes that **Alternative 4: Raise the Minimum Teacher Salary to $40,000** is the best option and is therefore the recommended approach. This option would have a large impact on equity for disadvantaged students, has a relatively simple implementation process, shows broad support among key policymakers, and is estimated to be more cost-effective than most other alternatives.

Introduction

Client Profile

SC for Ed is a nonprofit organization of public school teachers and supporters whose mission is educational empowerment through community and advocacy in South Carolina. It was created in 2018 as a Facebook group for public school teachers across the state to organize and discuss issues facing their districts and public education broadly. The group made headlines in 2019 for organizing a march on the SC State House of about 10,000 teachers and advocates calling for better conditions in public schools (Bowers, 2020).
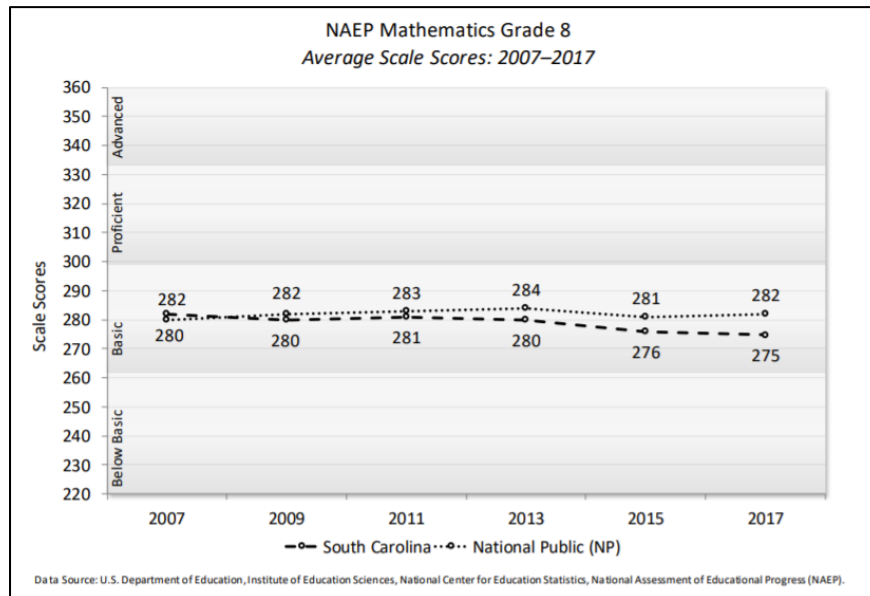
Problem Statement

Recent Trends in Mathematics Proficiency

Too few students are proficient in eighth grade mathematics in public schools in South Carolina. Between 2007 to 2017, the percentage of students in public schools in fourth grade scoring proficient or better on the mathematics portion of the National Assessment of Educational Progress (NAEP) in South Carolina fell from 36% to 32% (South Carolina Department of Education, 2018). Similarly, the results for students in eighth grade fell from 31% to 27% over the same time span. Results in 2019 were not statistically different from two years prior and the detrimental effects of COVID-19 adaptations on student performance are not yet fully known, so this is an extremely concerning pre-pandemic trend for South Carolina that is likely growing even worse (National Center for Education Statistics, 2020).

At the national level, fourth grade proficiency rose from 39% to 41% and eighth grade proficiency did not statistically change over the latest ten years of data (The Nation's Report Card, 2019). The average mathematics score for fourth grade in South Carolina in 2019 was 237, while Georgia and North Carolina saw averages of 238 and 241 and the country as a whole averaged 240 (Georgia Department of Education, 2019; NCES, 2020). SC eighth graders scored 276 on mathematics in 2019, below the national average of 281 and only ahead of New Mexico, Louisiana, Alabama, West Virginia, and D.C., while border states Georgia and North Carolina saw average scores of 279 and 284, respectively (GDOE, 2019; NCES, 2020). Average scores from 2007-2017 for South Carolina and the nation are shown below in Figure 1, clearly indicating a problem in SC schools (SCDOE, 2018).

Figure 1: Ten Year Trends in Eighth Grade Math Proficiency

NAEP Mathematics Grade 8
Average Scale Scores: 2007–2017

Data Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP).

Outline of Report

The following analysis proceeds as follows: first, the background of the current environment in South Carolina public schools is discussed, as well as the causes for the current problem of low mathematics proficiency among eighth grade students. There is then a review of the existing literature on common proposed solutions to problems of academic achievement in public schools. That section is followed by a breakdown of the criteria used to compare policy alternatives and a description of the alternatives and how they perform on the chosen criteria. Finally, there is a recommendation and implementation discussion followed by a short conclusion.

Background

Costs to Society of Low Proficiency

Direct Costs

The first step in determining an estimate for the costs to society of low mathematics scores on eighth grade NAEP tests in South Carolina is to project the number of low-scoring students who will drop out of high school. Using the NAEP achievement level results and data from the South Carolina Department of Education on dropouts and total enrollment, I can estimate the percentage of students that score (or would score) below basic that later dropout of school. 69.16% of eighth graders tested in 2013 scored below proficient on mathematics and total enrollment was approximately 54,204 students, so about 37,487 students would have scored below proficient if every eighth grader in South Carolina had been tested (The Nation's Report Card, 2020; SCDOE, 2018). About 5,449 students from this cohort dropped out of high school over the following four years, so the dropout rate for students scoring below proficient is estimated to be 14.54% (assuming all dropouts are below proficient). Results from the 2019 NAEP show that 71.1% of eighth graders tested scored below proficient on mathematics and total enrollment was approximately 57,145 students, so about 40,630 students would have scored below proficient if every student had been tested. Applying the 14.54% estimated dropout rate suggests that about 5,907 students will drop out by the time this tested cohort graduates in 2023.

Students that drop out of high school face a number of worse outcomes relative to graduates, including an increased likelihood of requiring public assistance, committing crimes, and earning less in wages. The lifetime costs of social support programs (Temporary Assistance for Needy Families, Unemployment Insurance, housing subsidies, the Supplemental Nutrition Assistance Program, and Medicaid) for a high school dropout are estimated at $22,000 and expected incarceration costs are about $13,000 (Carroll & Erkut, 2009). Applying these figures to the estimated number of dropouts calculated above yields $129,954,000 in social support costs and $76,791,000 in incarceration costs, meaning a *total direct cost* of $206,745,000.

Opportunity Costs

The opportunity cost includes the lower average wages and expected lifetime earnings for dropouts relative to graduates. According to Census Bureau data, the earnings gap between dropouts and graduates is about $200,000 over a lifetime (U.S. Census Bureau, 1994). This suggests an opportunity cost of about $1,181,400,000. Another component to opportunity cost is the lower life expectancy for high school dropouts, which is about nine years less than graduates on average (Romero, 2014). FDA official guidance on the Value of a Statistical Life Year (VSLY) suggests a value of $490,000, meaning the lost years of life for a typical dropout is valued at about $4,410,000 (Department of Health and Human Services, 2016). Applying this value to my estimate for dropouts in South Carolina yields an *opportunity cost* of

$26,049,870,000. There are virtually no issues of externalities, or hidden costs on third parties, so the focus of this analysis is on direct and opportunity costs. Taken together, my estimates suggest that the *total costs to society* of below proficient NAEP mathematics scores in eighth grade in South Carolina (and ensuing dropouts) are $27,438,015,000.

Setting the Stage

Education Governance in South Carolina

Article XI of the SC Constitution describes public education policy for the state, including the following in Section 3: "The General Assembly shall provide for the maintenance and support of a system of public schools open to all children in the State and shall establish, organize, and support such other public institutions of learning, as may be desirable" (SC Const. art. XI, § 3). Article XI also outlines a State Board of Education composed of a member from each of the judicial circuits elected by the legislative delegations of the counties within each circuit. The Board has the power to adopt rules, policies, and regulations consistent with state law for the governance of public schools in the state, adopt minimum standards necessary for providing adequate educational opportunities, prescribe and enforce rules for teacher certification, and prescribe and enforce the use of textbooks or other instructional materials (S.C. Code Ann. § 59-5-60). An example of this power structure in action can be seen in classroom sizes, where size limits are established by the Board but funding and enforcement must come from the Statehouse (Bowers, 2019). Finally, Section 2 establishes a State Superintendent of Education to serve as the chief administrative officer of the public education system. Responsibilities include general supervising/managing all public school funds in the state, organizing/staffing the State Department of Education, and administering all policies and procedures adopted by the Board through the Department (S.C. Code Ann. § 59-3-30). As a result of the failure of a 2018 referendum that would have allowed for appointment to the position by the Governor, the State Superintendent of Education in South Carolina remains a publicly elected position with a term length of four years (Lovegrove, 2018).

The Current Environment in Public Schools

Figure 2 below provides key demographic data about the public school population in the state of South Carolina. During the 2017-18 school year, there were about 51,000 teachers instructing more than 770,000 students, roughly 61% of which were students in poverty (SCDOE 2018; SCDOE, 2020). The plurality of students is concentrated in grades 4-8 at nearly 40%, which is the specific student group of interest in this report. About half of the student population is White, while African-Americans and Hispanics make up roughly 34% and 10%, respectively. Despite high levels of diversity among students, South Carolina teachers are overwhelmingly White (78%) and female (80%).

Figure 2: Overview of South Carolina Public Schools, 2017-18

		Total	Percent
ENROLLMENT BY GRADE SPAN 2017-18 at 135-Days	**Child Development (PK)**	28,282	3.7%
	Kindergarten (5-year-old)	55,940	7.2%
	Primary (Grades 1–3)	175,267	22.6%
	Elementary (Grades 4–8)	296,476	38.3%
	High School (Grades 9–12)	218,039	28.2%
	Total Enrollment	**774,004**	**100.0%**

		Total	Percent
ENROLLMENT BY RACE/ ETHNICITY 2017-18 at 135-Days	White	391,302	50.6%
	African American	260,164	33.6%
	Hispanic	74,792	9.7%
	Two or More Races	31,680	4.1%
	Asian/Pacific Islander	12,414	1.6%
	American Indian /Alaskan Native	2,479	0.3%
	Hawaiian or Other Pacific Islander	1,051	0.1%
	Not Reported	122	0.0%
	Total Enrollment	**774,004**	**100.0%**

		Number	Percent of Total
TEACHER PROFILES 2017-18 at End of Year	**Gender**		
	Male	9,696	18.9%
	Female	40,963	80.0%
	Not Reported	520	1.0%
	Ethnicity		
	African American	7,735	15.1%
	American Indian	96	0.2%
	Asian	631	1.2%
	Hispanic	859	1.7%
	White	40,031	78.2%
	Not Reported	1,827	3.6%
	Education/Certification Level		
	Bachelor's	14,353	28.0%
	BA + 18 hrs.	4,086	8.0%
	Master's	22,723	44.4%
	Master's + 30 hrs.	8,515	16.6%
	Doctorate	811	1.6%
	Not Reported	691	1.4%

Contributing Factors to Poor Performance in Mathematics

While the many factors that affect any given student's proficiency in math are interconnected in complex ways and not yet completely understood, there are several clues as to what is causing difficulties for many students in South Carolina.

Student Poverty – An obvious concern is the above-average levels of students in poverty in the state compared to the nation, as research on poverty shows that it is strongly correlated with poor performance in school (Ewijk & Sleegers, 2010; Jensen, 2013). The negative effects of student poverty on education are driven in part by generally worse health/well-being, weaker literacy/language development, less access to resources, and more housing instability (Parrett & Budge, 2016). SC Report Card data from 2020 show wide variation in the Pupils in Poverty (PIP) index between school districts, with a low of 20.1 in York 04 up to a high of 95 in Allendale 01 (SCDOE, 2020).

Spending per Student – School districts with above-average revenues per pupil have the flexibility to provide resources to their students above and beyond the minimum required by law, giving them a significant advantage in terms of advancing academic achievement. For example, the average teacher salary in South Carolina for the 2020-21 school year was $51,862, but this is larger than what might be expected from the state minimum salary schedule and reflects wealthier districts padding salaries with their local revenue sources. Within this statewide average, Florence 4 only paid its teachers an average of $46,268 while Lexington-Richland 5 paid an average of $56,719 (CERRA, 2021). Perhaps not surprisingly, the three year averages for

the percentage of teachers returning from the previous year for these districts were 82.2 and 92.9, respectively (SCDOE, 2021).

Class Size – Another issue is the fact that many school districts have average class sizes that are well above the state average, and studies have shown that students in classrooms with smaller student-teacher ratios tend to do better in math (Achilles et al., 1993; Whitehurst & Chingos, 2011). Figure 3 below shows the average class size in core subjects for seventh and eighth graders during 2017-18 by district. There is wide variation in average class size across the state, with the largest belonging to Pickens County School District at 25.3 students and the smallest belonging to Spartanburg School District 7 at 12.09 students (South Carolina Revenue and Fiscal Affairs Office, 2019). A South Carolina Teacher Education Advancement Consortium through Higher Education Research (SC-TEACHER) report on 2020-21 teacher vacancies showed that more than 11% of all vacant positions in the state were in mathematics and the problem was worse in rural/high-poverty districts (Dickenson et al., 2021). As a result, mathematics classes represent a disproportionate share of the classes with above-average student-teacher ratios compared to almost all other subject areas.

Figure 3: Grades 7-8 Average Class Size in Core Subjects, 2017-18
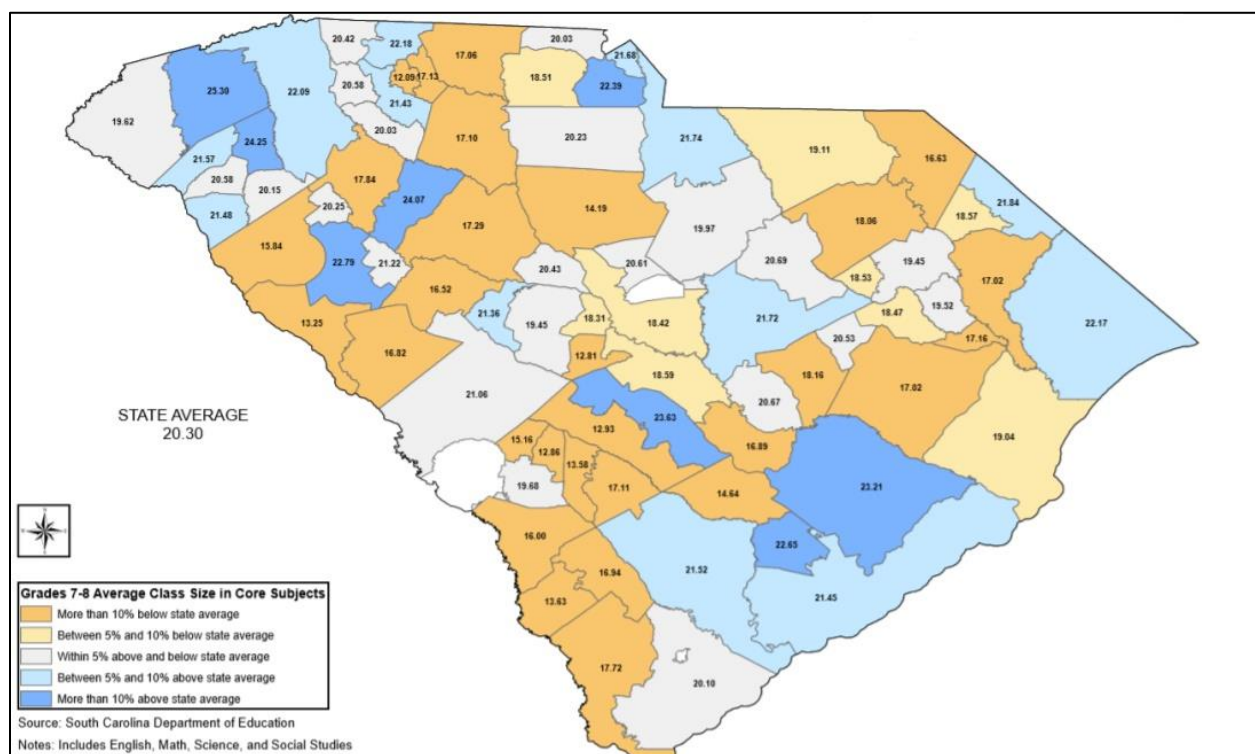
Teacher Quality – The fourth major factor that impacts student learning in math is the quality of the math teachers, which also varies widely by school district. South Carolina as a whole had an average teacher turnover rate of 7.3 in 2019-20, but this includes a low rate of 3.8 in Florence 5 up to a high of 32.0 in Barnwell 29 (CERRA, 2021). The process of replacing teachers takes significant time away from student learning and interrupts continuity in instruction, meaning the high turnover rates in some school districts are a key component of their poor student

performance. It can also harm average teacher quality if there are not enough qualified teachers available to hire, which is often the unfortunate reality districts experience in the current market for educators. A disturbing trend in recent years has been a growing gap between the number of departures from the profession and the number of graduates from traditional educator preparation programs in the state.

The Center for Educator Recruitment, Retention, and Advancement's annual *Educator Supply and Demand Report* shows that there were more than 1,000 teacher positions still vacant during the school year in September-October 2021, the largest number reported since they began collecting data in 2001 (CERRA, 2021). The biggest areas of concern are math, special education, and early childhood education, all three of which are connected to poor math proficiency in the state. A teacher shortage necessarily implies that average class sizes must increase or non-traditional educators must be found to fill classrooms (both of which can harm student learning), and South Carolina has implemented both of these strategies in recent years. The number of schools in South Carolina with average class sizes greater than 28 students expanded from 60 to 110 schools between 2008 and 2018, and state lawmakers passed a bill allowing people without teacher certifications to teach in public schools during the 2021 legislative session (Bowers, 2019; Mintzer, 2021).

Previous Attempts at Education Reform

It has never been a secret that far too many students in public schools in South Carolina are struggling to succeed. However, most attempts at reaching an agreement among a majority of state legislators fail before a starting point can even be determined. The 2018 legislative session saw around 200 education-related proposals introduced, yet only two dozen were passed into law and none were of significant consequence (Adcox et al., 2018). This pattern has led to general decline of public school quality even further over the years, convincing many legislators and citizens to abandon the idea of comprehensive reform and instead push for whatever incremental changes are popular in education policy in the moment. State Superintendent of Education Molly Spearman once summarized the challenge of true education reform: "We keep kicking the can down the road and keeping things like they are. I don't know if we can ever get everybody to sit down at the table and really change it" (Adcox et al., 2018).

The School Funding Debate in South Carolina

The current school funding process in South Carolina is a complex web of outdated laws and provisions that few truly understand. However, the basic outline goes back to the 1977 Education Finance Act, which detailed a base student cost calculation and a funding formula split between the state and local governments (based on a weighted number of pupils and local property wealth) that averages to about a 70/30 breakdown statewide (Tetreault & Chandler, 2000). Districts with high Indexes of Taxpaying Ability (ITAs) receive less than the 70% average, while districts with low ITAs receive more (League of Women Voters of South Carolina, 2010). Figure 4 below shows various student categories that are weighted and how they affect funding (South Carolina Revenue and Fiscal Affairs Office, 2022).

Figure 4: Student Weighting System

| Weights	Existing
Every student is assigned one of the following:	
Base for every student in K-12 (including homebound)	1.00
Students with Disabilities	From 1.74 to 2.57 based on intellectual disability
Precareer and Career Technology	1.29
Residential Treatment Facility	2.10
Additional weights are added to the above for:	
Pupils in Poverty	0.20
Gifted and Talented	0.15
Academic Assistance	0.15
Limited English Proficiency	0.20
Dual Credit Enrollment	0.15

While the basic EFA formula incorporates equity by ensuring that costs are shared between the state and districts such that the millage rates needed to fund the local shares of spending are the same for all districts, other funding streams do not consider equity and contribute to the significant disparities between districts. For example, property taxes on owner-occupied homes for school operations were eliminated in 2006 by Act 388 and district revenues were replaced with a portion of state sales taxes (League of Women Voters of South Carolina, 2010). More than 28% of state support takes this form of property tax relief funds, which are not tied to service needs/equity concerns but rather the amount and value of owner-occupied property within the district (South Carolina Revenue and Fiscal Affairs Office, 2019). The result is that districts like York 4 (<10% owner-occupied) with below-average shares of owner-occupied homes get less in property tax relief from the state but are better able to raise local money by increasing their mill rates, and the opposite is true for districts like Abbeville (about 50% owner-occupied) with above-average shares of owner-occupied properties (League of Women Voters of South Carolina, 2010). Local districts are thus free to attempt to raise additional revenues beyond their required share for hiring teachers or providing more services to their students, which is a significant disadvantage for poorer districts with smaller non-residential tax bases.

The issues of school finance made it to the court system in November of 1993 when forty school districts filed suit against South Carolina, claiming the state violated the equal protection clause of the U.S. Constitution and the education clause of the SC Constitution (Costner, 2009). The case came to be known as Abbeville County School District v. State of South Carolina, and it eventually made its way to the state's Supreme Court. After years of back-and-forth and multiple appeals, the South Carolina Supreme Court ruled 3-2 in 2014 that the state had violated their constitutional duty to provide students in the plaintiff districts with the opportunity to receive a minimally adequate education. The Court specifically noted the evidence that demonstrated insufficient transportation, poor teacher quality, high teacher turnover, district size, and poverty were all likely sources of the problems facing the plaintiff districts (*Abbeville Cty. Sch. Dist. v. State*, 2014). While the blame was largely placed on the state, the Court also pointed out that local leaders have at times prioritized things like student athletics over achievement in the

classroom (Hart, 2015). As a result, the Court ordered the plaintiff districts and defendants to work with each other to chart an appropriate path forward.

Though the SC House of Representatives responded quickly by establishing an Education Policy Review and Reform Task Force that offered insights and recommendations to the General Assembly in December 2015, legislators acted slowly and only passed a few changes related to minor capital improvement projects and funding for teacher recruitment/retention. The timely retirement of two justices on the Supreme Court allowed legislators to appoint new justices with more conservative views on the role of the judiciary in education, which ultimately led to a 3-2 decision in 2017 to vacate the previous Court's order in the *Abbeville* suit (Adcox et al., 2018; Gilreath, 2017). The lack of significant reform both before and in response to *Abbeville* has allowed the problems within public education to compound over time. Today, the issues of SC students ranking near the bottom of states in terms of standardized test scores and high school graduates not being prepared for college or careers are severe, and both are disproportionately driven by many of the same poor, racially diverse, and rural school districts that sued the state back in 1993.

**Figure 5: 2018-19 District Expenditures Per Pupil**
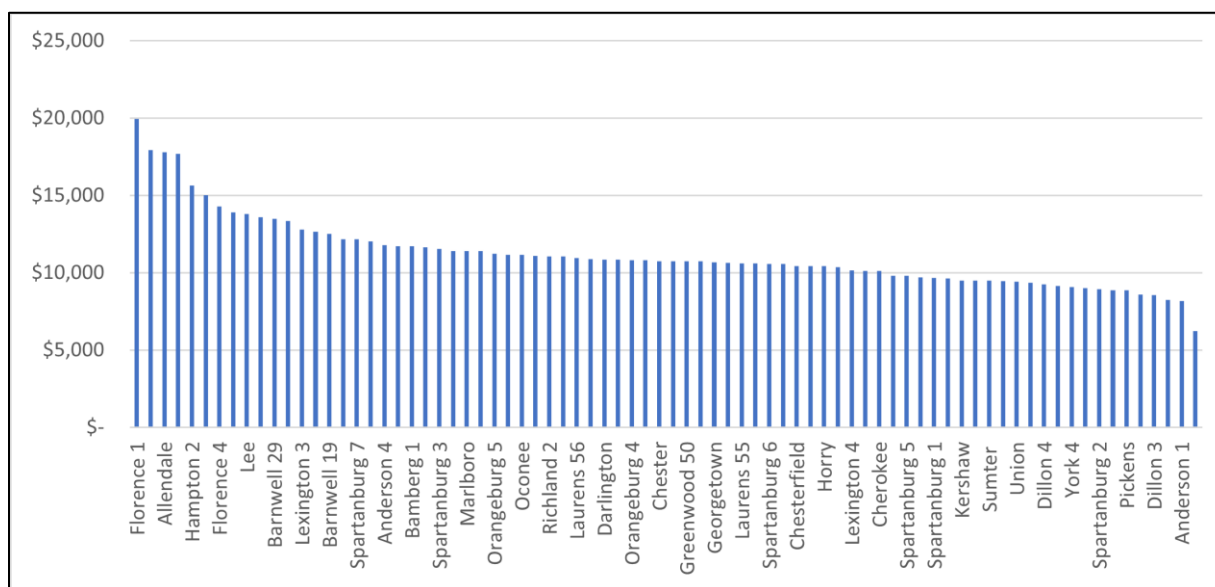
The now 77 traditional public school districts in South Carolina vary widely in terms of student body demographics, teacher quality, average expenditures per pupil, ability to raise revenues locally, and many more factors relevant to successfully educating students. Figure 5 below shows the per pupil spending for districts in South Carolina for 2018-19, where it is clear that districts like Florence 1 have much more flexibility when it comes to funding their schools than Dillon 3 or Anderson 1 (SCDOE, 2020). While one component of education law (distribution of EFA funds based on ITA) often works to address the inequalities across districts, another (Act 388 property tax relief) typically contributes to them.

The Impact of the Great Recession

The financial effects of the 2008/2009 global economic recession on state governments were a critical source of ensuing problems in public education, as it is typically the largest category of expenditures at the state level (Center on Budget and Policy Priorities, 2018). Between 2008 and 2018, the number of schools in South Carolina with average class sizes greater than 28 students expanded from 60 to 110 schools as teachers retired and districts could not fund an equal number of replacements (Bowers, 2019). Although the state has established a 28-student cap on average class sizes in elementary schools, there is no enforcement mechanism and many schools continue to break the law unabated. Legislators did respond to the financial pressure by cutting back on funding in general, shorting the base student cost formula by millions of dollars each year. Figure 6 below shows both the proper formula funding and what has actually been appropriated since 1991, indicating a gap of nearly $500 million in the 2018-2019 school year alone (Bowers, 2019). While the ongoing COVID-19 pandemic did lead to an unprecedented flow of resources to the states from the federal government that has largely not yet been allocated, the majority is one-time funding that cannot be used for long-term recurring expenses like teacher salaries.

Figure 6: Base Student Cost Funding (in millions)
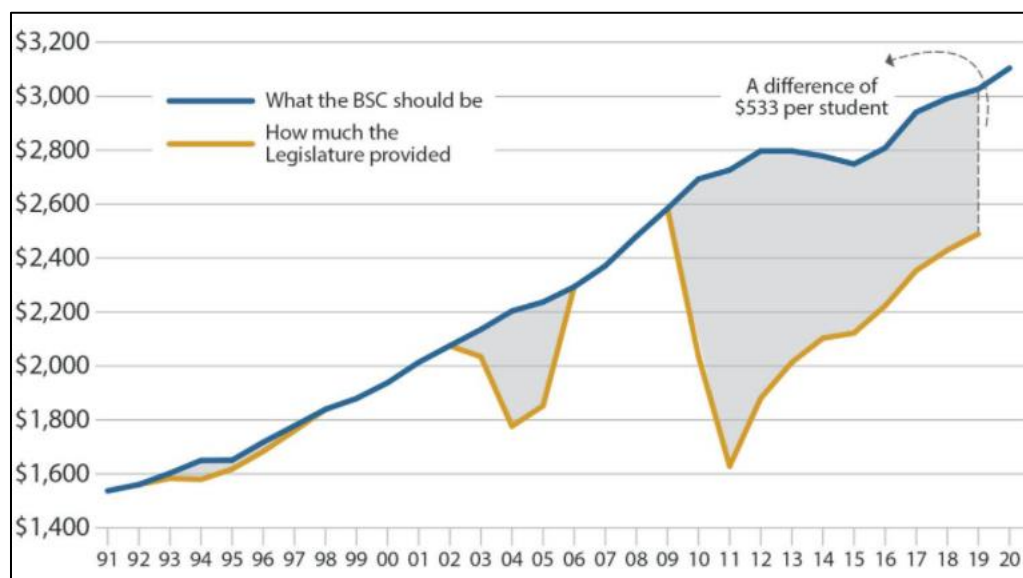
Existing Evidence

Class Size and Student Achievement

One of the most pivotal experiments in the history of education policy was Project STAR (Student-Teacher Achievement Ratio) in Tennessee beginning in the late 1980s. Designed by the state legislature to study the effects of class size on young students, the experiment randomly divided more than 11,000 kindergarteners entering schools across the state into small classes (13-17 students), regular classes (22-25 students), or regular with aide (22-25 and full-time teacher's aide) through the end of the 3rd grade (Mosteller, 1995). Results on criterion-referenced tests (CRT) and norm-referenced tests (NRT) show that student achievement on math and reading in smaller classes was significantly better than either type of regular class during all four years of the experiment, particularly for minority students (Achilles et al., 1993). The second phase of the project was the Lasting Benefits Study, which looked at Tennessee Comprehensive Assessment Program (TCAP) data for 4th and 5th grade students who had participated in STAR. Even two years after returning to regular class sizes, students in 5th grade who experienced small classes early on in their education were testing higher on math than those in regular classes by .18 of a standard deviation (Achilles et al., 1993).

The results of the Tennessee STAR experiment indicate that large changes in class sizes for early grades can have significant long-term impacts on student achievement, particularly for students from less advantaged backgrounds (Whitehurst & Chingos, 2011). The findings from STAR inspired a massive class size reduction (CSR) program implemented in 1996 in California, which sought to reduce average class size in their public schools from 28.5 students to 20 students by offering additional funding to school districts for every student learning in a classroom with twenty or fewer students (Schrag, 2007). Research on the effects of this policy resulted in inconclusive results in terms of student achievement, although some say there were other factors involved that affect any interpretations. Prior to implementation, about 2% of teachers did not have full teaching credentials. Four years after the CSR program began, that number was about 14% statewide and more than 20% in high poverty schools (Schrag, 2007). Given that there were no clear effects of smaller classes when many of them were suddenly staffed by teachers lacking credentials, particularly in high poverty schools with significant minority populations where class size reductions offer the most potential benefit, it is reasonable to assume there could have been positive effects if average teacher quality had not changed so drastically. However, the results of the CSR program in California might indicate the significant difficulty of effectively scaling any policy limiting class size to a statewide level, both in terms of budgeting and teacher staffing.

School Choice Programs

National enrollment in charter schools grew from 1.6 million students to 3.3 million students between fall 2009 and fall 2018, increasing its share of all public school students from 3% to 7% (National Center for Education Statistics, 2021). While public interest and enthusiasm for charter schools and school choice in general have grown in recent years, the significant variance in the effects of charter schools on student achievement nationwide should give parents and policymakers some concern. A study of 33 lottery-based charter middle schools across 13 states

found no average significant impact on student achievement in math or reading among students entering during the 2005-2006 and 2006-2007 school years (Clark et al., 2015). It is important to note here that the charter schools in the study were necessarily oversubscribed and they had lower percentages, on average, of African-American students, students eligible for free or reduced price lunches, and seventh graders failing to meet math and reading proficiency standards compared to the non-study charter middle schools examined, so the generalizability of these results is somewhat questionable. However, while they did not find any average impact on achievement or significant variation in impact by student race or gender, the researchers investigated effects by sub-groups of charters and found that "charter schools serving a high proportion of students certified for free or reduced price lunch had a positive and significant impact on year 2 math achievement, whereas charter schools serving a low proportion of these students have negative and significant impacts" (Clark et al., 2015). The same pattern of mixed effects occurred between urban and rural charter schools, which is consistent with previous research (Curto & Fryer, 2011; Angrist et al., 2013).

According to a Center for Research on Education Outcomes (CREDO) report published in 2019 on charter school performance in South Carolina, "the typical charter school student in SC exhibits similar academic progress in reading and weaker growth in math compared to the educational gains that the student would have made in a traditional public school" (CREDO, 2019). The authors noted significant variation in these results, however, including 15% of charter schools showing academic progress in math that is significantly stronger than the local district option while 33% show significantly weaker progress. Outside of South Carolina, there is evidence of significant and positive effects of charter school enrollment on student achievement in the Massachusetts system. The Knowledge is Power Program (KIPP) is a nationwide charter management organization that utilizes the No Excuses approach common to charter schools, and researchers were able to use applicant lotteries to investigate the impact of the program on student achievement through Massachusetts Comprehensive Assessment System (MCAS) data at KIPP Academy Lynn. They find that students attending KIPP "gain an average of $.35\sigma$ per year in math; these effects are slightly larger for limited English proficiency (LEP) and special education (SPED) students" (Angrist et al., 2010). A similar analysis of multiple charter schools in Boston that were oversubscribed found that the effect of attending a middle school charter was $.26\sigma$ in math on the MCAS per year of attendance, which was enough to raise MCAS math proficiency by about 12 percentage points above the non-charter rate of about half of students (Cohodes et al., 2013). Given the wide dispersion in effects of charter schools on improving student achievement in mathematics, any push for expansion of charters in South Carolina must consider stringent accountability standards and periodic evaluations of efficacy.

Perhaps as a result of the lackluster results of charter schools in South Carolina, the school choice debate has shifted focus in recent years towards improving school choice opportunities for students through voucher programs. Research on the effects on student achievement for students that participate in school choice programs that do not involve charter schools is mixed, but there are instances of counterintuitive results. (Abdulkadiroglu et al., 2018) examined the Louisiana Scholarship Program, which is a voucher program that provides public funding for disadvantaged students to attend private schools. The program began in New Orleans in 2008 but was expanded statewide in 2012, and the researchers are able to exploit the random lottery mechanism used when private schools faced more eligible applicants than seats available. Comparing outcomes for lottery winners and losers in 2013, estimates show attending an LSP-

eligible private school resulted in average math scores 0.41 standard deviations *lower*. The authors note that LSP-eligible private schools charge lower tuition that nonparticipating schools, and the negative math effects are concentrated among the eligible schools with the lowest tuition. (Cullen et al., 2006) examines intradistrict school choice in Chicago Public Schools (CPS), a system in which students apply to attend public magnet schools and programs outside of their neighborhood school but within the same school district. Similar to (Abdulkadiroglu et al., 2018), the researchers utilize random lottery results from oversubscribed schools to determine casual effects of school choice. Results of their analysis show no evidence that lottery winners perform systematically better on math exam scores.

Although it is not clear that school choice opportunities provide any academic benefits for students that participate, economic theory suggests that the competition for students faced by public schools following the creation of a school choice program might lead to improved outcomes for public school students that do not participate in the program. (Hoxby, 2002) considers this possibility in an analysis of three different school choice programs in Milwaukee, Michigan, and Arizona. Beginning in the 1990-91 school year, disadvantaged students in Milwaukee were eligible for vouchers that could be used at private schools and the public school would lose state aid equal to half the value of the voucher. Because public schools faced varying pressure from the program based on their proportion of disadvantaged students, (Hoxby, 2002) compares outcomes between three different categories of schools: most treated (more than two-thirds of students eligible), somewhat treated (less than two-thirds eligible), and untreated comparison schools. Results on math scores show gains of 7, 5, and 4 percentile points, respectively, indicating that the program raised achievement by 1-3 percentile points. The Michigan analysis examines outcomes for districts that faced significant competition (6% or more decline in enrollment) from charter schools following the 1994 law that allowed for their creation. Results show a small gain of 2.5 scale points in math achievement in fourth grade, although impacts for seventh grade were not statistically significant. Finally, the Arizona analysis utilizes the same methods as the Michigan analysis following Arizona's 1994 charter law. Results are similar, with a gain of 1.39 percentile points in math in fourth grade but statistically insignificant effects for seventh grade math scores.

Teacher Salary and Student Performance

Research suggests that teacher quality is one of the most important school-based inputs in education for improving student achievement (Goldhaber & Anthony, 2003; Aaronson et al., 2007; Hanushek, 2016). What is less obvious is how to best approach improving teacher quality broadly at public schools in a cost-effective way. Strategies that have been explored include implementing various accountability systems, offering merit pay based on student test scores, and expanding professional development offerings. North Carolina implemented a statewide merit pay system in the 1996-1997 school year in which all teachers in a public school received cash bonuses up to $1,500 each year if their students' performance on end-of-grade (EOG) examinations indicates above expected growth. Basic time-series analysis shows that proficiency rates on EOG tests and the lower-stakes NAEP increased by 12 and 7 percentage points, respectively, between 1998 and 2007 (Vigdor, 2008). While these results are promising, it is important to understand that there was no comparison group (all public schools were treated) and the system was implemented alongside a new school rating system that could have also impacted achievement.

A different study that did use random assignment to investigate financial incentives for teachers on student performance was called The Project on Incentives in Teaching (POINT). The project was a three-year study on incentives for mathematics teachers in Nashville from 2006-2007 through 2008-2009 that awarded bonuses of $5,000, $10,000, or $15,000 for student test scores at the historical 80th, 90th, and 95th percentiles (Springer et al., 2010). After three years, researchers found no "significant difference overall between students whose teachers were assigned to the treatment group (eligible for bonuses) and those whose teachers were assigned to the control group" (Springer et al., 2010). They go on to cite survey data indicating that most teachers did not change their behavior because they believed they were already doing the best job they could in teaching their students. (Hansen et al., 2004) provides a different analysis by examining teacher salaries and effects on retention rather than student achievement directly. The researchers utilize the Annualized Cost of Living (ACOL) model to estimate future teacher earnings and their impact on turnover among teachers at salary steps 10 and below in a large urban public school district. Their results suggest that an increase in pay of 1 percent is associated with a 0.7 percent decline in turnover. Given that research shows the returns to experience are largest for young teachers and conservative estimates found in (Ladd & Sorensen, 2017) suggest a year of experience is worth 0.07 standard deviations in math achievement, a focus on salary increases for starting teachers would likely yield the largest results in terms of achievement through declines in turnover.

Tutoring Programs

There is already a rich literature on the positive effects of peer tutoring on academic outcomes for students in a variety of settings (Fuchs et al., 2008; Robinson et al., 2005; Topping, 2005). Peer tutoring and mentoring programs are of particular interest from a public policy standpoint due to their relatively lower costs compared to other strategies to improve student achievement. Leung (2015) analyzed more than 70 publications with sufficient data to aggregate effect sizes in a meta-analysis to investigate factors that impact the effectiveness of peer tutoring programs. With a sample of studies in which the mean age of tutees was 12.66 years, he finds an average effect size of .34 for mathematics achievement on standardized testing. Effects were largest for tutees with high and low ability levels, while tutees with more average abilities still benefited but to a lesser extent. Interestingly, this pattern also holds for tutors themselves, meaning high and low ability tutors were shown to be most effective. Frequency of sessions, length of each session, and total dosage were all nonsignificant factors, but studies with 10 or fewer total weeks for tutoring actually showed larger effect sizes than those with >10 weeks of tutoring. Finally, the socioeconomic status (SES) of participants did not significantly alter the results of tutoring.

Kunsch et al. (2007) was a meta-analysis study similar to Leung (2015) but focused on students with disabilities or those at risk for mathematics disabilities. They find an overall mean effect size for the 17 studies analyzed of .47 on mathematics achievement on mostly researcher-developed mathematics tests. They also explore heterogeneity in results to show larger effects for elementary school students compared to secondary school students and students at risk for mathematical disabilities compared to students with disabilities. Effects were also larger in general education classrooms relative to special education classrooms, while length of treatment (>16 weeks vs. 4-16 weeks) did not significantly change the effect size, contrary to Leung (2015). While these overall results are encouraging, the researchers caution that the current literature on tutoring with both treatment and control groups is remarkably thin. 11/17 of the

studies analyzed were published between 1990 and 1999 and had the largest average effect size (0.60), while the three from prior to 1990 and the three from 2000-2004 had smaller average effects of .52 and .11, respectively. Further research is also needed to specifically address the problems of traditional tutoring programs in achieving commensurate gains for students with disabilities.

Summary

Common strategies to raise student achievement include lowering average class sizes, providing school choice opportunities, raising teacher salaries, and promoting the utilization of supplementary educational services like tutoring. Research indicates that students do perform better when they learn in smaller class sizes, particularly for young students and those from disadvantaged backgrounds. However, the challenge in scaling class size reduction to a statewide level is ensuring that average teacher quality does not suffer as a result of the need to hire many additional teachers. Evidence on the impacts of school choice programs is mixed, but the effect of charter school enrollment on student achievement in South Carolina specifically is negative on average (although there is wide variation). Research on voucher programs and intradistrict choice lottery programs show largely insignificant impacts on math achievement, although (Hoxby, 2002) indicates that Milwaukee's voucher program led to small gains for public schools facing competition from voucher-eligible private schools. The effect of salary increases for teachers on student achievement directly varies, but higher salaries do impact turnover and teacher experience has been shown to improve student achievement, particularly for early-career teachers. Finally, tutoring programs tend to show relatively large impacts on student achievement in math. However, causal research is significantly limited and the challenge with large-scale tutoring is fostering student persistence in the absence of required programming.

Criteria

To determine the optimal policy, each of the proposed policy alternatives in this report will be analyzed using the following criteria structure:

Cost-Effectiveness

Cost-effectiveness measures of the alternatives take the form of point estimates, which measure the estimated cost in dollars for each additional mathematics proficient eighth grade student generated. In order to ensure all necessary data were complete and publicly available, the base year for this analysis is the 2019-20 school year. Estimates are generated under a time horizon of ten years, meaning the final year of analysis is the 2029-30 school year.

Equity

A second consideration for determining the best alternative approach is the impact on equity, defined as the extent to which the alternative addresses disparities in achievement between groups of students. For example, policies targeted to low-income students, schools, or school districts would be deemed more equitable than policies available to all students because low-income students belong to a subgroup with generally worse outcomes in education. Equity will be measured in relative terms of high, medium, or low.

Political Feasibility

Another critical criterion is the political feasibility of the alternative, which is difficult to accurately measure but is defined as the likelihood of the alternative being passed by the Legislature and signed by Governor McMaster. Factors that will be considered for the political feasibility of alternatives include previous public statements of key figures, polling data on public opinion related to the policy, and whether a similar policy is currently going through the legislative process or did in the past without being enacted into law. The opinions of policy leaders like Governor McMaster, Senate Majority Leader Shane Massey, House Majority Leader Gary Simrill, Senate Education Committee Chairman Greg Hembree, and House Education and Public Works Committee Chairwoman Rita Allison will receive special consideration. Political feasibility of alternatives will be measured in relative terms of high, medium, or low.

Administrative Feasibility

Finally, ease of implementation will be considered for all alternatives. Similar to political feasibility, this criterion is more qualitative in nature and will consider several factors. First, the degree of buy-in among the staff of relevant agencies will be estimated by considering the extent to which the alternative is controversial. For example, there are strong feelings on both sides of the debate around school choice policies, but free tutoring programs for low-income students are

widely seen as a positive and worthwhile approach to improving student achievement. A second factor can be described as complexity/scope, meaning the extent to which the alternative is a radical change from the status quo and the likelihood it will require significant oversight or adjustments over time. Administrative feasibility will be measured in relative terms of high, medium, or low.

Methodology

All alternatives are evaluated on each of these criteria to complete the outcomes matrix and inform the ultimate policy recommendation. The equity criterion receives the highest weight at 0.4 because of the fact that while students in South Carolina do not perform well in mathematics on average, there are significant disparities among subgroups and low-income students in particular face unique challenges in their education that should be at the forefront of any new public policy. Cost-effectiveness, political feasibility, and administrative feasibility each receive a weight of 0.2 in this analysis because all three are important factors that will drive the success or failure of any of the alternatives proposed.

The estimates of cost-effectiveness are developed by dividing the present value of the cost of implementation by the anticipated number of additional math proficient eighth grade students generated. Present values of all costs are estimated using a discount rate of 3%, though in keeping with Office of Management and Budget guidance a 7% rate is also used to evaluate the significance of using 3% in the primary analysis. Though these results are not substantively different than those using a 3% rate, these additional cost-effectiveness estimates are available upon request. Cost projections are best estimates based on outside evidence of similar policies or, in some cases, existing government projections. For example, the Revenue and Fiscal Affairs Office has already produced an Estimated Fiscal Impact report for a Senate version of an Education Scholarship Account program.

Similarly, effectiveness is determined by gathering outside evidence of the impacts of similar policies and applying those anticipated effects to population projections of eighth grade public school students. Major assumptions include a constant rate of growth in K-12 spending calculated using data over the last decade will continue (status quo alternative), the historical share of eighth graders in the total K-12 population will remain constant, K-12 spending is spread equally among grades such that eighth grade spending can be isolated using student headcount by grade data, and student achievement will experience negative impacts due to the interruptions in normal education caused by the pandemic for the first several years of analysis but will eventually return to pre-pandemic trends. Additional information about assumptions and methodologies specific to each alternative is available in the appendix of this report.

Alternatives

The following policy alternatives have been selected for consideration based on rigorous analysis of the existing research literature and guidance from the client organization. Each policy will be specifically outlined and evaluated on the criteria listed above.

Alternative 1: Maintain the Status Quo

This alternative implies all current policies are maintained and serves as a baseline to which all other alternatives can be compared. Under the status quo, recent trends in mathematics proficiency are used to make projections through the ten year time horizon and costs are estimated using the average growth in K-12 spending between the 2009-10 and 2019-20 school years.

Cost-Effectiveness

Estimating the cost-effectiveness of this alternative is done by applying several assumptions to the data on recent trends. The first assumption is that the recent average growth rate of the eighth grade student population (1.3%/year) continues throughout the time horizon. For the math proficiency estimates, it is assumed that the 2017 and 2019 results (21%) are maintained in the base year and experience a slight decline over the next several years due to the negative effects of pandemic-related shutdowns and transitions to online learning. It is also assumed that schools recover and return to pre-pandemic proficiency levels by 2026-27 and experience no further changes during the rest of the time horizon. The overall cost-effectiveness estimate for the status quo is $57,370 per math proficient eighth grade student.[1]

Equity

While NAEP proficiency results are based on samples of the total student population and cannot be analyzed at a narrower level than statewide, there are other data that provide evidence of significant disparities across student groups within the state under the status quo. At the district level, the Pupils in Poverty Index ranges from 20.1 to 95, average class sizes range from 12.09 to 25.3, and average teacher turnover ranges from 3.8 to 32.0 annually. In the large majority of cases, low-income students are concentrated in districts on the worse end of these disparities. As a result, the equity rating of the status quo is low.

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[1] See Appendix A for a detailed description of estimated cost calculations.

Political Feasibility

Given the declining rate of math proficiency among students in recent years and the unprecedented flow of federal funding to states in response to the pandemic, policymakers in South Carolina are eager to implement reforms to the current education system in the state. While announcing his budget proposal earlier this year, Governor McMaster stated, "If we take advantage of this once-in-a-lifetime opportunity by making big, bold, and transformative investments in education, infrastructure, and workforce and economic development, South Carolina will prosper for generations to come" (Houck, 2022). Education reform is also a priority for the legislature, as both houses are actively working on education-related legislation from a variety of angles. As a result, the political feasibility of the status quo is rated as low.

Administrative Feasibility

Under the status quo alternative, by definition nothing significant will change from an administrative standpoint. Therefore, the administrative feasibility of maintaining the status quo is rated as high.

Alternative 2: Incentivize Class Size Reduction

This alternative is a new policy intended to address the growing problem of schools with average class sizes above the legal but unenforced mandate of 28 students per teacher. Under this policy, schools above the 28 student cap would be offered up to $1,000 per student in additional funding for getting below the cap. The funding incentive would be phased in by $100 each year starting in 2020-21, ultimately reaching $1,000 per student in the 2029-30 school year. The state would pay for this alternative with the record surplus revenue accumulated in recent years, provided that a bill is passed by the legislature and signed into law by Governor McMaster.

Cost-Effectiveness

To determine the cost-effectiveness of a class size reduction incentive policy, it is first assumed that the average growth in the number of schools above the 28 student cap over the last decade continues over the time horizon (5.5 schools/year). The gradual approach of this policy is assumed to induce 5% of these schools to go below the cap in the first year, and this rate would reach 50% by the end of the time horizon when the reduction incentives are maximized. The historical average share of eighth grade students in the K-12 population and the average school size are then used to generate estimates of the number of eighth graders learning in smaller classes. Based on the success of the Tennessee STAR program and the failure of California's CSR program described in the existing evidence section, it is assumed that the effect of smaller

class sizes on math proficiency is a moderate 0.09 standard deviations. The overall cost-effectiveness estimate of this alternative is $56,192 per math proficient eighth grade student.[2]

Equity

This alternative is intended to provide additional resources to schools that have a demonstrated need (i.e., schools with average class sizes above 28 students per teacher likely struggle to fund salaries for additional teachers). A safe assumption to make is that schools with larger average class sizes are also schools with disproportionate shares of low-income, disadvantaged students that drive low average achievement. As a result, the equity rating of this alternative is high.

Political Feasibility

Estimating the political feasibility of this alternative is challenging because state leaders often pursue education reforms that allow for flexibility in how improvements in student achievement are to be pursued by school districts. Governor McMaster recently proposed a change to the funding formula that would allow districts to spend any additional funding on issues they determine to be most pressing, whether that be administrators, teacher salary increases, or smaller class sizes (Collins, 2022). In 2019, the Senate Education Committee Chairman posted the following message on his twitter account: "To clarify – student/teacher ratio is not a measure of class size. Allocation of manpower is a district decision. But being ranked 21st in the country tells us that our teacher workforce is in line with other states" (Hembree, 2019). Given the general attitude of a hands-off approach toward specific policy changes among state policymakers, the political feasibility of this alternative is rated as low.

Administrative Feasibility

From an administrative standpoint, this alternative would require continued collection of data on average class sizes in public schools across the state. Given that budget decisions are made in the spring during a legislative session but school staffing is generally not complete until late summer, a potential challenge is determining how much funding to set aside in order to fund these incentives. Based on these considerations, the administrative feasibility of this alternative is rated as medium.

Alternative 3: Create Education Scholarship Accounts

An Education Scholarship Account (ESA) program would create online scholarship accounts for eligible, participating students to be used to fund educational expenses like tuition at schools within or outside of their residential districts, including private schools. The scholarship amount would be set to the average of state funding per pupil for the current fiscal year, and to be

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[2] See Appendix B for a detailed description of estimated cost calculations.

eligible a student's adjusted gross family income must be less than or equal to 200% of the federal poverty line. Enrollment would initially be capped at 5,000 students in K-3rd and would increase by 5,000 and include students in K-5th the following year. Year 3 would be capped at 15,000 students among K-8th and year 4 would be capped at 20,000 students among all K-12th eligible students. After the 4th year, enrollment would not be capped at all. Because accounts would be funded by transferring the state funding from the residential public school of the departing student, the only additional funding necessary would be for the up to 4% of total ESA amount used for administrative purposes. To account for this, some of the general fund surplus revenue would need to be appropriated by the legislature and approved by Governor McMaster.

Cost-Effectiveness

Estimating the cost-effectiveness of an ESA program involves several assumptions. First, it is assumed that the historical share of eighth grade students (7.5%) is maintained over the time horizon. In years 3 and 4 when eighth grade students become eligible but total enrollment is capped, it is assumed that all of the estimated eligible eighth grade students participate in the program. In the following years, the assumption is that 10% of the total eligible population participate and the rate increases by 5% for two years and 10% during the final three years of the time horizon. Based on the research on school choice programs outlined in the existing evidence section, it is assumed that participating students do not see boosted achievement but eligible public school students that do not participate do see improved math proficiency as a result of changes made in response to competition. Improvement is limited to just 1.5 percentile points, which is based on a conservative estimate of the impacts measured by (Hoxby, 2002). The overall cost-effectiveness estimate of this alternative is $57,427 per math proficient eighth grade student.[3]

Equity

This alternative is specifically designed to limit enrollment in the program to only those students with adjusted gross family incomes less than or equal to 200% of the federal poverty line. However, as described in the analysis of school choice research in the existing evidence section, it is not guaranteed that participating students will experience any improvement in their academic achievement. Therefore, although the intention of the policy is certainly to promote equity, whether actual outcomes will lead to improved equity for disadvantaged students is far less clear. As a result, the equity rating of this alternative is medium.

Political Feasibility

School choice has become a common theme in education reform talks among state policymakers in recent years. At the time of this writing, the South Carolina Senate just recently passed an

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[3] See Appendix C for a detailed description of estimated cost calculations.

ESA bill and sent it to the House for consideration (Styf, 2022). In addition, Governor McMaster recently noted his eagerness to support such a program in his annual State of the State address: "I am proposing $20 million to be used to create education savings accounts, which, by the way, have been available in 'red' and 'blue' states for years" (Kauffman, 2022). Finally, Speaker of the House Jay Lucas is a sponsor of the House's version of the bill and said early last year, "This legislation opens the door for the parents of our state's most vulnerable children to make the choices that will maximize their child's educational opportunities" (Lucas, 2021). Given this broad support among key leaders, the political feasibility of this alternative is high.

Administrative Feasibility

Relative to the other alternatives, the administration of an ESA program is somewhat complicated. An online portal must be created in order to provide students with both a way to apply to the program and access to their online scholarship accounts once accepted, as well as to securely collect student achievement data from education service providers that enroll these students. The Senate version of the bill also requires the Department of Administration to provide annual reports of the program and the results of a parental satisfaction survey to the General Assembly. Because of these challenges, the administrative feasibility of this alternative is rated as low.

Alternative 4: Raise the Minimum Teacher Salary

This alternative would require the legislature to approve adjusting the state salary schedule to raise the minimum teacher salary across South Carolina from $36,000 per year to $40,000 per year and adjusted to an average 2% inflation annually thereafter. Funding this alternative would require a portion of the general fund surplus revenue to be appropriated by the legislature and approved by the Governor.

Cost-Effectiveness

Determining the cost-effectiveness of this alternative would require several key assumptions. It is first assumed that the recent historical average of early career departures (2,493) continues throughout the time horizon. Based on (Hansen et al., 2004), the second assumption is that the approximately 11% raise from $36,000 to $40,000 results in a decline in turnover of 7.8%. Using average school size and the average share of eighth grade students, an estimate of the number of eighth grade students in classrooms with more experienced teachers is generated. Finally, the results from (Ladd & Sorensen, 2017) are used to generate the number of additional math proficient eighth grade students. The overall cost-effectiveness estimate for this alternative is $56,199 per math proficient eighth grade student.[4]

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[4] See Appendix D for a detailed description of estimated cost calculations.

Equity

School districts with disproportionate shares of both early career teachers and teachers earning the legal minimum salary are concentrated in low-income areas. These districts have limited opportunities to raise significant local funds in order to boost their teacher salaries, so turnover is a major problem for their schools and their large proportions of disadvantaged students suffer as a result. Based on the fact that these types of school districts will be most affected by this policy change, the equity rating of this alternative is high.

Political Feasibility

In January of this year, Governor McMaster proposed raising the minimum teacher salary to $38,000, just half of that proposed in this alternative (Merryman & Chhetri, 2022). However, a House spending plan currently in the legislative process would adopt the full increase to $40,000 that this policy option suggests (Adcox, 2022). Although the Governor seems willing to approve the full increase if it is passed by the legislature, Senate Majority Leader Shane Massey appears more hesitant, as he was quoted earlier this year saying, "I hear them asking for money. That's what I hear them asking for and right now the last few years, I don't know if there's any school district in the state that has spent all its money" (Breeding, 2022). Based on this mixed support, the political feasibility of this alternative is rated as medium.

Administrative Feasibility

The administration of this alternative is relatively simple. Once the legislature passes a bill with both a new mandated minimum teacher salary and additional state funding to pay for the increases and it is then signed by Governor McMaster, school districts would not be allowed to pay any less than $40,000 for teacher salaries. Given this simplicity, the administrative feasibility of this alternative is rated as high.

Alternative 5: Incentivize Free Online Tutoring

The final alternative relates to the online tutoring partnership between the South Carolina State Library and the tutor.com provider established through federal pandemic relief funding that was received last year. Current policy spends the funding over a three-year period, so this alternative involves extending the program through the entire time horizon. In addition, based on research that shows tutoring can be tremendously effective but the challenge is getting students to fully participate, this alternative requires legislative action that would provide $100 to each student that completes a full 40 hours/year as an incentive for participation.

Cost-Effectiveness

To determine the cost-effectiveness of this alternative, it is first assumed that between 10-15% of eighth graders would be utilizing the online tutoring with any regularity. It is then assumed that only 5% of those students would be willing to complete the required 40 hours to receive the incentive. Based on the research on the effects of full dosage of tutoring on academic achievement described above in the existing evidence section, it is assumed that these students would experience a somewhat conservative improvement of 0.3 standard deviations. The overall cost-effectiveness estimate for this alternative is $56,946 per math proficient eighth grade student.[5]

Equity

While school staff would undoubtedly work to encourage participation among lower performing students and the economic theory of diminishing marginal utility suggests that disadvantaged students would be more eager to receive the incentive, South Carolina has a problem with internet access. A 2020 analysis from the SC Department of Education estimates that at least 150,000 households with students do not have stable internet access at home (Coyle, 2020). Given these mixed issues, the equity rating of this alternative is medium.

Political Feasibility

Given that this is a relatively unique policy alternative, there is limited evidence on its potential political feasibility. However, the general idea of providing financial rewards for specific student activities is likely to be looked upon with significant aversion. Based on this policy being a significant change in state involvement in education activities and the lack of discussion around it in current education reform talks, the political feasibility of this alternative is rated as low.

Administrative Feasibility

Finally, the administrative feasibility of this alternative is somewhat complex. This policy change would require a system for tracking student participation over the course of an academic year and setting aside funding to ensure all earned incentives are able to be provided. However, because the partnership is already in place, the difficulty of these additional requirements would be somewhat minimized. Therefore, the administrative feasibility of this alternative is rated as medium.

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[5] See Appendix E for a detailed description of estimated cost calculations.

Outcomes Matrix

Table 1: Projected Outcomes

	Cost-Effectiveness	*Equity*	*Political Feasibility*	*Administrative Feasibility*
Weight	0.2	0.4	0.2	0.2
Alt. 1: Maintain Status Quo	$57,370	Low	Low	High
Alt. 2: Incentivize CSR	$56,192	High	Low	Medium
Alt. 3: Create ESA Program	$57,427	Medium	High	Low
Alt. 4: Raise Minimum Salary	$56,199	High	Medium	High
Alt. 5: Incentivize Online Tutoring	$56,946	Medium	Low	Medium

Findings

In the outcome matrix above, the alternative(s) performing relatively well on a given criterion are shaded green while those performing relatively poorly are shaded red. For the cost-effectiveness estimates, all five alternatives are within a narrow range around $56,827 per math proficient eighth grade student and alternatives (2) and (4) are the lowest and nearly identical. (2) and (4) also have the highest equity rating, while only maintaining the status quo received an equity rating of low due to all of the disparities in public education under current law. Alternative (3) was the only policy to receive a high political feasibility rating because of its broad support among key policymakers, and the rest were rated low besides raising the minimum teacher salary. Finally, both the status quo and raising the minimum teacher salary have high administrative feasibility due to their relative simplicity, while only the creation of the ESA program is rated as low because it is the most complex option.

Recommendation

Based on this analysis, it is recommended that the South Carolina Legislature and Governor McMaster implement a policy of raising the minimum teacher salary from $36,000 per year to $40,000 per year. Although both this alternative and incentivizing class size reductions received multiple optimal ratings under the criteria in the outcomes matrix, the cost-effectiveness estimates are nearly identical and CSR reduction received a low rating for political feasibility. The purpose of the recommended alternative is to stem the tide of high teacher turnover and boost average teacher experience in public schools across the state, particularly for school districts with disproportionate shares of disadvantaged students and limited capacity for raising salaries on their own through increases in local tax rates. For this reason, it is one of two alternatives to receive a high rating on the equity criterion. Finally, raising the minimum teacher salary is relatively simple, which is why it is the only alternative earning an administrative feasibility rating of high besides maintaining the status quo.

Implementation

The implementation of the recommended alternative is relatively simple, although there are a few issues that should receive attention to ensure that this policy change yields the most impact on early career teachers in South Carolina and public school students. One concern is that many school districts already pay their teachers above or close to the proposed increase to $40,000. A potential unintended consequence of this alternative is that district leaders in relatively higher salary areas may experience pressure from their teachers to raise their salaries as well, despite the fact that additional state funding would only be provided to ensure all teachers are at a minimum of $40,000. As a result, high salary districts might be forced to raise local taxes to provide for additional salary increases beyond the $40,000 minimum. Another potential concern is that more experienced teachers that are higher on the salary schedule would not experience any changes to their salaries despite generally being more effective educators, which could generate resentment and a feeling of disrespect from their legislative representatives. Teachers already above the $40,000 threshold might be induced to accelerate their retirement or move to a different school district, which would introduce new pressure on the teacher shortage problem.

Conclusion

The problem of too few public school students in South Carolina being proficient in mathematics is a growing issue and will not be improved under the status quo of education policy. Students with limited skills in mathematics are at a severe disadvantage relative to their peers, as they are more likely to drop out and earn far less in total income over their lifetimes. Raising the

minimum teacher salary will improve academic achievement among South Carolina students indirectly by addressing the growing teacher shortage and high rates of annual turnover. Research shows that experienced teachers are more effective and students learn far more under their direction compared to teachers with no experience. It is time for the South Carolina Legislature to recognize the value public school teachers bring to their careers and pay them accordingly.

Appendix A. Cost Estimates for Alternative 1

The cost-effectiveness of the status quo is estimated by generating estimates of eighth grade spending throughout the ten year time horizon. In order to make these estimates, historical data from the South Carolina Revenue and Fiscal Affairs Office is gathered on K-12 spending from 2009-10 through 2019-20. An average growth rate from this period is applied to all future annual estimates. Finally, the average share of eighth grade students in the K-12 system (7.5%) is used to estimate the spending dedicated to this group of students. This assumes that school spending is constant across grade levels, which may be a strong assumption. Detailed cost estimates are provided in the table below.

Estimated Eighth Grade Spending Per Year

	Annual Cost
2019-20	$805,424,224
2020-21	$832,078,599
2021-22	$859,615,062
2022-23	$888,062,806
2023-24	$917,451,988
2024-25	$947,813,763
2025-26	$979,180,318
2026-27	$1,011,584,905
2027-28	$1,045,061,876
2028-29	$1,079,646,720
2029-30	$1,115,376,100
Total	$9,675,872,137
NPV	$8,188,497,473
discount rate	3%
CE Ratio	$ 57,370

Appendix B. Cost Estimates for Alternative 2

The cost-effectiveness of the class size reduction incentive program is estimated by first predicting the number of schools that will be above the 28 student cap over the ten year time horizon. There were 60 schools above the cap in 2008 and 115 schools in 2018, which yields an average annual growth rate of 5.5 schools per year. Due to the phase-in approach of the per student incentives, it is assumed that 5% of these schools are induced to go below the cap in the first year and the rate increases by 5% each year thereafter, ending at 50% in the final year of the time horizon. Applying the average school size to these estimates of induced schools yields the estimated cost of the program each year. Detailed cost estimates are provided in the table below.

Estimated Cost of Class Size Reduction Incentive Program

	CSR Program Cost	Total Spending
2019-20	n/a	n/a
2020-21	$393,750	$832,472,349
2021-22	$1,665,119	$861,280,181
2022-23	$3,953,957	$892,016,763
2023-24	$7,406,503	$924,858,491
2024-25	$12,175,576	$959,989,339
2025-26	$18,420,785	$997,601,103
2026-27	$26,308,731	$1,037,893,636
2027-28	$36,013,225	$1,081,075,101
2028-29	$47,715,505	$1,127,362,225
2029-30	$61,604,459	$1,176,980,559
Total		$9,891,529,747
NPV		$8,358,808,220
discount rate		3%
CE Ratio		$ 56,192

Appendix C. Cost Estimates for Alternative 3

The cost-effectiveness of the Education Scholarship Account (ESA) program is estimated by using data from the South Carolina Revenue and Fiscal Affairs Office's Statement of Estimated Fiscal Impact for Senate bill S. 0935, available here (https://rfa.sc.gov/sites/default/files/impact/S0935%202021-12-07%20introduced.pdf). Assuming a general cross section of public school students in South Carolina will participate, the only additional costs are related to the administration of the program. These costs are estimated by the Revenue and Fiscal Affairs Office to be $2,283,000 per year. Detailed cost estimates are provided in the table below.

Estimated Cost of ESA Program

	ESA Program Cost	*Total Spending*
2019-20	n/a	n/a
2020-21	$2,283,000	$834,361,599
2021-22	$2,283,000	$861,898,062
2022-23	$2,283,000	$890,345,806
2023-24	$2,283,000	$919,734,988
2024-25	$2,283,000	$950,096,763
2025-26	$2,283,000	$981,463,318
2026-27	$2,283,000	$1,013,867,905
2027-28	$2,283,000	$1,047,344,876
2028-29	$2,283,000	$1,081,929,720
2029-30	$2,283,000	$1,117,659,100
Total		$9,698,702,137
NPV		$8,207,971,926
discount rate		3%
CE Ratio		$ 57,427

Appendix D. Cost Estimates for Alternative 4

The cost-effectiveness of raising the minimum teacher salary from $36,000 to $40,000 relies on estimates of various salary schedule changes prepared by the SC Department of Education and summarized by the Revenue and Fiscal Affairs Office, available here (https://rfa.sc.gov/sites/default/files/2020-08/FY%202020-21%20Teacher%20Salary%20Report_0.pdf). This analysis suggests that raising the minimum salary to $38,000 would cost approximately $79,291,573, a number that is doubled and then multiplied by 7.5% for this analysis (to account for the full $40,000 minimum and the estimated share of eighth grade spending). Finally, this cost is increased by 2% annually to account for inflation. Detailed cost estimates are provided in the table below.

Estimated Cost of Raising the Minimum Teacher Salary

	8th Grade Salary Cost	Total Spending
2019-20	n/a	n/a
2020-21	$11,893,736	$843,972,335
2021-22	$12,131,611	$871,746,673
2022-23	$12,374,243	$900,437,049
2023-24	$12,621,728	$930,073,716
2024-25	$12,874,162	$960,687,925
2025-26	$13,131,646	$992,311,964
2026-27	$13,394,279	$1,024,979,184
2027-28	$13,662,164	$1,058,724,040
2028-29	$13,935,407	$1,093,582,127
2029-30	$14,214,116	$1,129,590,215
Total		$9,806,105,228
NPV		$8,299,054,114
discount rate		3%
CE Ratio		$ 56,199

Appendix E. Cost Estimates for Alternative 5

The cost-effectiveness of extending the free online tutoring partnership and offering completion incentives for students requires first assuming that the current three-year, $1.5 million partnership implies an annual administration cost of the program of $500,000. In addition to this cost, the amount of incentive money distributed is estimated using the number of eighth grade students who are assumed to complete the program each year, multiplied by $100. Detailed cost estimates are provided in the table below.

Estimated Cost of Extending the Tutoring Program and Offering Incentives

	Tutoring Program Cost	Total Spending
2019-20	n/a	n/a
2020-21	$539,600	$832,618,199
2021-22	$550,922	$860,165,984
2022-23	$562,487	$888,625,293
2023-24	$574,303	$918,026,291
2024-25	$586,373	$948,400,136
2025-26	$598,704	$979,779,022
2026-27	$611,302	$1,012,196,207
2027-28	$624,173	$1,045,686,049
2028-29	$637,323	$1,080,284,043
2029-30	$650,758	$1,116,026,858
Total		$9,681,808,082
NPV		$8,193,535,337
discount rate		3%
CE Ratio		$ 56,946

References

Aaronson, D., Barrow, L., & Sander, W. (2007). Teachers and Student Achievement in the Chicago Public High Schools. WP 2002-28. Revised. *Journal of Labor Economics*. https://doi.org/10.1086/508733

Abbeville County School District v. State (Abbeville II), 767 S.E.2d 157 (S.C. 2014).

Abdulkadiroglu, A., Pathak, P., & Walters, C. (2018). Free to Choose: Can School Choice Reduce Student Achievement? *American Economic Journal: Applied Economics*, 10 (1): 175-206. https://doi.org/10.1257/app.20160634

Achilles, C. M. (1993). The Lasting Benefits Study (LBS) in Grades 4 and 5 (1990-1991): A Legacy from Tennessee's Four-Year (K-3) Class-Size Study (1985-1989), Project STAR. Paper #7. https://eric.ed.gov/?id=ED356559

Adcox, S., Hawes, J. B., Bowers, P., Moore, T., & Smith, G. (2018, November 14). Crisis of Our Own Making: Lawmakers Have Spun Their Wheels on Education for Decades. *The Post and Courier.* Retrieved from https://data.postandcourier.com/saga/minimally-adequate/page/4

Adcox, S. (2022, March 28). SC Gov. Henry McMaster Addresses 'Confusion' Over Proposed $4,000 Teacher Pay Hike. *The Post and Courier.* Retrieved from https://www.postandcourier.com/politics/legislature/sc-gov-henry-mcmaster-addresses-confusion-over-proposed-4-000-teacher-pay-hike/article_dfd9c948-aeab-11ec-bd68-c363ca4c69d9.html

Angrist, J. D., Dynarski, S., Kane, T. J., Pathak, P. A., & Walters, C. R. (2010). Who Benefits from KIPP? *National Bureau of Economic Research*. https://doi.org/10.1002/pam.21647

Angrist, J. D., Parag P., and Walters, C. R. (2013, October). Explaining Charter School Effectiveness. *American Economic Journal: Applied Economics*, 5 (4): 1-27. http://dx.doi.org/10.1257/app.5.4.1

Bowers, P. (2020, September 14). 10,000 South Carolina Teachers, Supporters March on the Statehouse. *The Post and Courier.* Retrieved from https://www.postandcourier.com/news/10-000-south-carolina-teachers-supporters-march-on-the-statehouse/article_4507e9da-6a8a-11e9-b66c-7b128dfe6021.html

Bowers, P. (2019, January 13). South Carolina Hasn't Enforced Classroom Size Limits Since 2010. It's Starting to Show. *The Post and Courier.* Retrieved from https://www.postandcourier.com/news/south-carolina-hasnt-enforced-classroom-size-limits-since-2010-its-starting-to-show/article_b0c0dbd4-0f7f-11e9-aedc-4b43e1478281.html

Breeding, B. (2022, February 9). Crisis in the Classroom: Teachers Demand Better Working Conditions, Pay. *Fox 28 News – Savannah*. Retrieved from https://fox28media.com/news/local/crisis-in-the-classroom-teachers-demand-better-working-conditions-pay

Carroll, Stephen J. and Emre Erkut. (2009). How Taxpayers Benefit When Students Attain Higher Levels of Education. *RAND Corporation*. Retrieved from https://www.rand.org/pubs/research_briefs/RB9461.html.

Center for Educator Recruitment, Retention, and Advancement. (2021). 2020-21 Average Teacher Salary, By District. Retrieved from https://www.cerra.org/uploads/1/7/6/8/17684955/avgteachersal_20-21.pdf

Center for Educator Recruitment, Retention, and Advancement. (2021). Teacher Turnover in South Carolina. Retrieved from https://www.cerra.org/uploads/1/7/6/8/17684955/teacherturnover_5yr_20-21.pdf

Center for Educator Recruitment, Retention, and Advancement. (2021, November). South Carolina Annual Educator Supply and Demand Report. Retrieved from https://www.cerra.org/uploads/1/7/6/8/17684955/2021-22_supply_demand_report__1_.pdf

Center on Budget and Policy Priorities. (2018, July 25). Policy Basics: Where Do Our State Tax Dollars Go? *Center on Budget and Policy Priorities.* Retrieved from https://www.cbpp.org/research/state-budget-and-tax/where-do-our-state-tax-dollars-go

Clark, M. A., Clark, M., Gleason, P., Tuttle, C. C., & Silverberg, M. K. (2015). Do Charter Schools Improve Student Achievement? *Educational Evaluation and Policy Analysis*. https://doi.org/10.3102/0162373714558292

Cohodes, S., Education, S., Setren, E., Setren, E., Walters, C. R., Angrist, J. D., & Pathak, P. A. (2013, October). Charter School Demand and Effectiveness: A Boston Update. *MIT School Effectiveness and Inequality Initiative*. https://blueprintlabs.mit.edu/research/charter-school-demand-and-effectiveness-a-boston-update/

Collins, J. (2022, January 8). SC Governor Proposes Overhaul to School Funding Formula. *The Associated Press*. Retrieved from https://www.counton2.com/news/south-carolina-news/sc-governor-proposes-overhaul-to-school-funding-formula/

Costner, C. (2009, May). Equity to Adequacy: A Historical Analysis of the Litigations of Abbeville v. The State of South Carolina. *Clemson University: TigerPrints*. 359. Retrieved from https://tigerprints.clemson.edu/all_dissertations/359

Coyle, C. (2020, July 15). Technology a Challenge for Some Rural South Carolina School Districts. *Live 5 News*. Retrieved from https://www.live5news.com/2020/07/15/tech-challenges-rural-south-carolina-school-districts/

Cullen, J., Jacob, B., & Levitt, S. (2006, September). The Effect of School Choice on Participants: Evidence From Randomized Lotteries. *Econometrica*, 74 (5): 1191-1230. https://doi.org/10.1111/j.1468-0262.2006.00702.x

Curto, V. E., & Fryer, R. G. (2011). Estimating the Returns to Urban Boarding Schools: Evidence from SEED. *National Bureau of Economic Research*. https://www.nber.org/papers/w16746

Dickenson, T. S., Hodges, T. E., Kunz, G. M., & Garrett, J. J. (2021, April). Exploring the
Uniformity of South Carolina Teacher Vacancies: Policy and Practice Implications for
Addressing the Teacher Shortage in South Carolina. *South Carolina Teacher Education
Advancement Consortium through Higher Education.* Retrieved from https://sc-
teacher.org/wp-content/uploads/2021/04/SC-T-Vacancy-paper_FINAL.pdf

Ewijk, R. V., & Sleegers, P. (2010, January). The Effects of Peer Socioeconomic Status on
Student Achievement: A Meta-Analysis. *Educational Research Review.*
https://dx.doi.org/10.2139/ssrn.1402645

Fuchs, L. S., Fuchs, D., Powell, S. R., Seethaler, P. M., Cirino, P. T., & Fletcher, J. M. (2008).
Intensive Intervention for Students with Mathematics Disabilities: Seven Principles of
Effective Practice. *Learning Disability Quarterly.* https://doi.org/10.2307/20528819

Georgia Department of Education. (2019, October 29). *NAEP Testing Brief – Mathematics 2019.*
Retrieved from https://www.gadoe.org/Curriculum-Instruction-and-
Assessment/Assessment/Pages/NAEP-Statewide-Scores.aspx

Gilreath, A. (2017, November 20). SC High Court Vacates Abbeville Lawsuit Decision. *Index-
Journal.* Retrieved from https://www.indexjournal.com/news/breaking/sc-high-court-
vacates-abbeville-lawsuit-decision/article_e185b52e-6399-5017-997b-
620701866ca4.html

Goldhaber, D., & Anthony, E. (2003). Teacher Quality and Student Achievement. Urban
Diversity Series. *Education Resources Information Center.* Retrieved from
https://eric.ed.gov/?id=ED477271

Hansen, M., Lien, D., Cavalluzzo, L., & Wenger, J. (2004, March). Relative Pay and Teacher
Retention: An Empirical Analysis in a Large Urban District. *The CNA Corporation.*
Retrieved from https://eric.ed.gov/?id=ED485516

Hanushek, E. A. (2016). School Human Capital and Teacher Salary Policies. *Journal of
Professional Capital and Community,* Vol. 1 Iss 1 pp. 23 - 40. Retrieved from
https://doi.org/10.1108/jpcc-07-2015-0002

Hart, L. C. (2015, August). Abbeville County School District v. State of South Carolina: How
Did We Get Here and What Happens Now? *South Carolina School Boards Association
School Law Conference.* Retrieved from https://www.scsba.org/training/2015-schoollaw-
handout-hart.pdf

Hembree, G. [@GregHembree]. (2019, April 26). To clarify-student/teacher ratio is not a
measure of class size. Allocation of manpower is a district decision. But being ranked
21st in the country tells us that our teacher workforce is in line with other states. [Tweet].
Retrieved from https://twitter.com/GregHembree/status/1121742259437940737

Houck, T. (2022, January 11). Tax Cuts, Infrastructure, Education Among Gov. McMaster's
2022 Priorities. *WYFF News 4.* Retrieved from https://www.wyff4.com/article/tax-cuts-
infrastructure-education-among-gov-mcmasters-2022-priorities/38739513#

Hoxby, C. (2002, April). School Choice and School Productivity (Or Could School Choice be a Tide that Lifts All Boats?) *National Bureau of Economic Research*, Working Paper No. 8873. Retrieved from https://www.nber.org/papers/w8873

Jensen, E. (2013, May 1). How Poverty Affects Classroom Engagement. *Association for Supervision and Curriculum Development.* Retrieved from https://www.ascd.org/el/articles/how-poverty-affects-classroom-engagement

Kauffman, J. (2022, January 20). GOP-Backed Bill Could Put State Funding Toward Private School Tuition. *WLTX News 19*. Retrieved from https://www.wltx.com/article/news/politics/gop-bill-state-funding-private-school-tuition-south-carolina/101-c1918ae8-b0cb-41b4-b02f-ec0b0c2546cb

Kunsch, C. A., Jitendra, A. K., & Sood, S. (2007). The Effects of Peer-Mediated Instruction in Mathematics for Students with Learning Problems: A Research Synthesis. *Learning Disabilities Research and Practice*. Retrieved from https://doi.org/10.1111/j.1540-5826.2007.00226.x

League of Women Voters of South Carolina. (2010, September). South Carolina's Education Funding Puzzle: Part 1 – The Education Finance Act Piece. Retrieved from https://my.lwv.org/south-carolina/positions/financing-education

Leung, K. C. C. (2015). Preliminary Empirical Model of Crucial Determinants of Best Practice for Peer Tutoring on Academic Achievement. *Journal of Educational Psychology*. Retrieved from https://doi.org/10.1037/a0037698

Lovegrove, J. (2018, December 23). After Failed Referendum, SC Lawmakers Unlikely to Retry Appointing Superintendent. *The Post and Courier.* Retrieved from https://www.postandcourier.com/politics/after-failed-referendum-sc-lawmakers-unlikely-to-retry-appointing-superintendent/article_302f78e4-0210-11e9-a869-4f3aee21c590.html

Lucas, J. (2021, February 24). Education Scholarship Account Legislation Introduced in House. *Speaker of The South Carolina House*. Retrieved from https://schousespeaker.com/education-scholarship-account-legislation-introduced-in-house/

Merryman, K., & Chhetri, D. (2022, January 8). McMaster Proposes Education Funding Overhaul, Increased Staff Pay, Improved Transparency. *Greenville News*. Retrieved from https://www.greenvilleonline.com/story/news/education/2022/01/08/south-carolina-governor-mcmaster-proposes-increase-staff-pay-education-funding-changes-teachers/9134255002/

Mintzer, A. (2021, April 6). SC House Passes Bill Allowing Noncertified Teachers in Schools to Fill Vacancies. *WIS News*. Retrieved from https://www.wistv.com/2021/04/06/sc-house-passes-bill-allowing-noncertified-teachers-schools-fill-vacancies/

Moore, T. (2020, September 14). Ideas for SC Education Reform Abound in Past Studies Left to Gather Dust. *The Post and Courier.* Retrieved from https://www.postandcourier.com/news/ideas-for-sc-education-reform-abound-in-past-studies-left-to-gather-dust/article_202890a8-f99a-11e8-a2d8-137f077fe5eb.html

Mosteller, F. (1995). The Tennessee Study of Class Size in the Early School Grades. *The Future of Children*. Retrieved from https://doi.org/10.2307/1602360

National Center for Education Statistics, Institute of Education Sciences. (2020). 2019 Mathematics State Snapshot Reports: South Carolina Grades 4 and 8. *U.S. Department of Education*. Retrieved from https://www.nationsreportcard.gov/profiles/stateprofile/overview/SC?cti=PgTab_OT&chort=1&sub=MAT&sj=SC&fs=Grade&st=MN&year=2019R3&sg=Gender%3A+Male+vs.+Female&sgv=Difference&ts=Single+Year&sfj=NP

National Center for Education Statistics, Institute of Education Sciences. (2020). 2019 Mathematics State Snapshot Reports: North Carolina Grades 4 and 8. *U.S. Department of Education*. Retrieved from https://www.nationsreportcard.gov/profiles/stateprofile/overview/NC?cti=PgTab_OT&chort=1&sub=MAT&sj=NC&fs=Grade&st=MN&year=2019R3&sg=Gender%3A+Male+vs.+Female&sgv=Difference&ts=Single+Year&sfj=NP&selectedJurisdiction=NC

National Center for Education Statistics. (2020, October). Number and Percentage of Public School Students Eligible for Free or Reduced-Price Lunch, by State. *U.S. Department of Education.* Retrieved from https://nces.ed.gov/programs/digest/d20/tables/dt20_204.10.asp

National Center for Education Statistics. (2021, May). Public Charter School Enrollment. *U.S. Department of Education*. https://nces.ed.gov/programs/coe/indicator/cgb

Office of Research and Data Analysis, South Carolina Department of Education. (2019, May). Quick Facts Education in South Carolina. Retrieved from https://ed.sc.gov/data/other/quick-facts-about-south-carolina-education/2018-sc-education-quick-facts/

Office of the Assistant Secretary for Planning and Evaluation. (2016). "Guidelines for Regulatory Impact Analysis." U.S. Department of Health and Human Services. Retrieved from https://aspe.hhs.gov/sites/default/files/private/pdf/242926/HHS_RIAGuidance.pdf#page=26

Parrett, W. & Budge, K. (2016, January 13). How Does Poverty Influence Learning? *George Lucas Educational Foundation*. Retrieved from https://www.edutopia.org/blog/how-does-poverty-influence-learning-william-parrett-kathleen-budge

Robinson, D. R., Schofield, J. W., & Steers-Wentzell, K. L. (2005). Peer and Cross-Age Tutoring in Math: Outcomes and Their Design Implications. *Educational Psychology Review*. https://doi.org/10.1007/s10648-005-8137-2

Romero, Jessie. (2014). The Dropout Dilemma: Why Do Kids Drop Out of High School, and What Can Be Done to Help Them Finish? *Federal Reserve Bank of Richmond*. Retrieved from https://www.richmondfed.org/publications/research/econ_focus/2014/q3/feature1

S.C. Code Ann. § 59-5-60, available at https://www.scstatehouse.gov/code/t59c005.php

Schrag, P. (2007). Policy from the Hip: Class-Size Reduction in California. *Brookings Papers on Education Policy*, *9*, 229–243. http://www.jstor.org/stable/20067283

Springer, M. G., Ballou, D., Hamilton, L. S., Le, V.-N., Lockwood, J. R., McCaffrey, D. F., Pepper, M. J., & Stecher, B. M. (2011). Teacher Pay for Performance: Experimental Evidence from the Project on Incentives in Teaching (POINT). *Society for Research on Educational Effectiveness*. https://www.rand.org/content/dam/rand/pubs/reprints/2010/RAND_RP1416.pdf

South Carolina Department of Education. (2018). South Carolina NAEP Trend Results: Reading and Mathematics, 2007-2017. *National Center for Education Statistics.* Retrieved from https://ed.sc.gov/tests/tests-files/naep-files/sc-naep-2007-2017-trend-report/

South Carolina Department of Education. (2018, July). Report on Student Dropout Rates. Retrieved from https://ed.sc.gov/districts-schools/school-safety/discipline-related-reports/dropout-data/2016-17-state-dropout-report/

South Carolina Department of Education. (2019, November). District Headcount by Gender, Ethnicity, and Pupils in Poverty 2019-20: 45-Day Active Headcount. Retrieved from https://ed.sc.gov/data/other/student-counts/active-student-headcounts/

South Carolina Department of Education. (2020). ESSA Per Pupil Expenditure Report, Fiscal Year 2019. Retrieved from https://ed.sc.gov/finance/financial-data/every-student-succeeds-act-essa-per-pupil-expenditure-reporting/fiscal-year-2019-essa-report-card-data-information/

South Carolina Department of Education. (2018). 2018 SC Education Quick Facts. *Office of Research and Data Analysis*. Retrieved from https://ed.sc.gov/data/other/quick-facts-about-south-carolina-education/

South Carolina Department of Education. (2020). 2020 Report Card Data. *Office of Research and Data Analysis*. Retrieved from https://ed.sc.gov/policy/federal-education-programs/esser-funding-information/emergency-assistance-to-non-public-schools/poverty-data-overview/

South Carolina Department of Education. (2020, October 6). 2020 State Poverty Index. *Office of Research and Data Analysis*. Retrieved from https://screportcards.ed.sc.gov/files/2020/data-files/

South Carolina Department of Education. (2021). 2020-21 District Comparison: Florence 4 and Lexington-Richland 5. Retrieved from https://screportcards.ed.sc.gov/overview/school-environment/class-environment/?q=eT0yMDIxJmQ9MjEwNCwzMjA1JmlzQ29tcGFyZT10cnVl

South Carolina Revenue and Fiscal Affairs Office. (2019, October 3). Education Funding Model Report: Formula, Assumptions, and Funding Options. Retrieved from https://rfa.sc.gov/sites/default/files/2021-08/Education%20Funding%20Report%20-Final%2010-03-19%20Updated%20100319_0.pdf

South Carolina Revenue and Fiscal Affairs Office. (2022, January 19). Education Funding Reform - Executive Budget FY23 Presentation. Retrieved from https://rfa.sc.gov/education-funding-model

Styf, J. (2022, April 1). South Carolina Senate Passes Education Scholarship Account Bill. *The Center Square*. Retrieved from https://www.thecentersquare.com/south_carolina/south-carolina-senate-passes-education-scholarship-account-bill/article_77c06f90-b12d-11ec-9b42-cfc4005e63a6.html

Tetreault, D. R., & Chandler, D. (2000). Public School Finance Programs of the United States and Canada: South Carolina. *National Center for Education Statistics.* Retrieved from https://nces.ed.gov/edfin/pdf/StFinance/SouthCa.pdf

The Nation's Report Card. (2019). NAEP Report Card: 2019 NAEP Mathematics Assessment – Highlighted Results at Grades 4 and 8. *National Center for Education Statistics.* Retrieved from https://www.nationsreportcard.gov/highlights/mathematics/2019/

The Nation's Report Card. (2020). State Profiles: South Carolina. *National Center for Education Statistics.* Retrieved from https://www.nationsreportcard.gov/profiles/stateprofile/overview/SC?cti=PgTab_OT&chort=2&sub=MAT&sj=SC&fs=Grade&st=MN&year=2019R3&sg=Gender%3A+Male+vs.+Female&sgv=Difference&ts=Single+Year&tss=2019R3-2019R3&sfj=NP

Topping, K. J. (2005). Trends in Peer Learning. *Educational Psychology*. https://doi.org/10.1080/01443410500345172

U.S. Bureau of the Census. (1994, August). "Statistical Brief: More Education Means Higher Career Earnings." Retrieved from https://www.census.gov/prod/1/statbrief/sb94_17.pdf

Vigdor, J. L. (2008). Teacher Salary Bonuses in North Carolina. Working Paper 2008-03. *Performance Incentives; Their Growing Impact on American K-12 Education*. https://my.vanderbilt.edu/performanceincentives/files/2012/10/200803_Vigdor_TeacherBonusesNC.pdf

Whitehurst, G. J., & Chingos, M. M. (2011, May 11). Class Size: What Research Says and What It Means for State Policy. *Brookings Institute*. https://www.brookings.edu/research/class-size-what-research-says-and-what-it-means-for-state-policy/

Will, M. (2019, April 30). Which States Have the Highest and Lowest Teacher Salaries? *EdWeek.org*. Retrieved from https://www.edweek.org/teaching-learning/which-states-have-the-highest-and-lowest-teacher-salaries/2019/04