Staff Allocation in Richmond Public Schools

Prepared for the Richmond Public School's Office of School Planning

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RPS RICHMOND PUBLIC SCHOOLS

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DISCLAIMER

The author conducted this study as part of the program of professional education at the Frank Batten School of Leadership and Public Policy at the University of Virginia. This paper is submitted in partial fulfillment of the course requirements for the Master of Public Policy degree. The judgements 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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LIST OF ABBREVIATIONS

ACP	Alternative Certification Program
CSR	Class Size Ratio, the ratio of students to teachers in a classroom or school. Often presented numerically, ex. 24:1.
ERW	English, Reading, and Writing subjects
FTE	Full-Time Employee
FY	Fiscal Year (July – June)
RPS	Richmond City Public School District
SD	Standard Deviations
SY	School Year (Sept – June)
SOL	Standards of Learning tests
SOQ	Standards of Quality guidelines
VDOE	Virginia Department of Education

EXECUTIVE SUMMARY

Students in Richmond Public Schools are underperforming on several measures of student achievement. This includes standardized testing scores and on-time graduation rates that are well below the state average. Poor achievement has lasting impacts on the students that RPS serves. **This underperformance is partially driven by sub-optimal allocation of staffing resources, particularly those related to instruction, across the district.** RPS is concerned with this issue because they seek to leverage available resources to best support student learning and achievement.

This report proposes the following policy options for Richmond Public School's consideration:

1. Maintaining the Status Quo
2. Altering Class Size Reduction Guidelines in Low-Performing Elementary Schools
3. Increasing Instructional Coaches in Low- Performing Schools

Each of these alternatives is assessed on the basis of cost-effectiveness, equitable impact, and administrative feasibility. Following careful consideration, this analysis recommends that RPS adopt **Alternative 3: Increasing Instructional Coaches in Low-Performing Schools** because this approach performs best on the equity criterion. Additionally, it is likely to provide the greatest anticipated increase in student achievement scores for the least cost of implementation.

INTRODUCTION

Client Profile

The Richmond City Public School District serves to provide impactful educational experiences from pre-K through 12th grade for the children and families living in Richmond, Virginia. To fulfill this purpose, Richmond Public Schools operates 4 preschool centers, 25 elementary schools, 7 middle schools, 5 high schools, and 3 specialty schools. Richmond Public Schools has historically struggled to improve the educational achievement of its students. While some factors that impact educational outcomes are outside of the sphere of influence for any school district, RPS does have several levers available that may produce improved results. RPS is dedicated to exploring potential solutions to boost student achievement through a variety of interventions. As part of this process, the Office of School Planning[1] engaged with the author of this report in an effort to understand the potential role of staff allocation changes as a means to boost important student outcomes. RPS is concerned about sub-optimal staff resourcing because they wish to ensure that they are leveraging available resources to best support student learning and achievement. This commitment can be seen in RPS' most recent strategic plan which includes several goals related to teacher allocation (Hudaskco, 2019).

In order to prepare for this policy analysis, the author engaged with the School Planning Team and the Chief Talent Officer to systematically understand where RPS is currently allocating their staff and to identify any potential disparities. The product of this work is several supporting documents that are helping to inform staff leveling across the district for the SY 2021-22 in a more systematic and transparent manner. This report builds upon this foundation by focusing on how RPS can improve current staffing methods to better support student achievement.

Problem Statement

Students in Richmond Public Schools are underperforming on several measures of student achievement. This is partially driven by the sub-optimal allocation of key staffing resources—chiefly, those related to teaching—across the district.

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[1] The School Planning Team assists with the development and improvement of systems across RPS. Projects that the team oversees include division-wide enrollment, the school application process for families who are interested in attending out-of-zone schools, master scheduling, and staffing.

Outline

This report is outlined as follows: first, it will review the relevant context pertaining to Richmond Public Schools. Then, it will move forward to discuss the available literature concerning staff allocation and student performance before offering potential policy solutions for RPS to consider. These options will be subject to a criteria-driven evaluation and a recommendation will be made with an accompanying implementation plan.

BACKGROUND

RPS Student Demographics & Performance

The Richmond City Public School district currently serves over 28,000 children. The majority of these students (51.9%) are considered economically disadvantaged.[2] In terms of racial and ethnic demographics, RPS' student body is predominantly Black, with significant subpopulations of White and Hispanic students (see Figure 1). Additionally, English Language Learners and students with disabilities each comprise 12.6% of the student population.

RPS Student Demographics

Multiple Races 3.4%
Asian 1.6%
Other 0.2%
Hispanic 18.5%
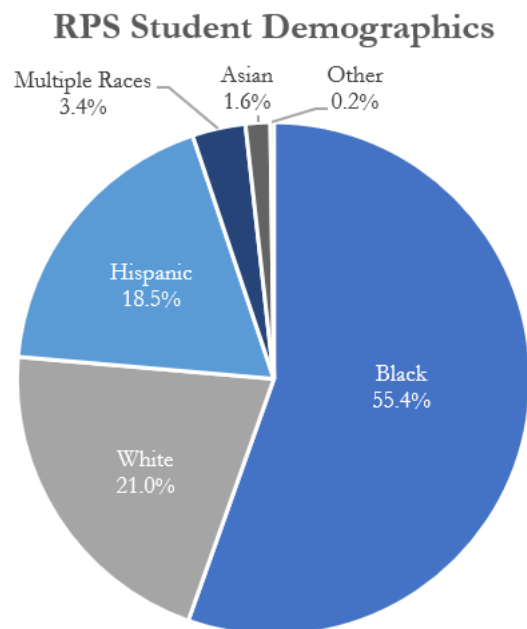Black 55.4%
White 21.0%

Figure 1

The Virginia Department of Education measures student achievement through the Standards of Learning tests. Generally speaking, RPS' SOL performance falls well below the state average. While only 56% of RPS students passed their reading exams in SY 2018-19, 78% of all Virginian students passed.[3] This pattern of underperformance is seen to varying degrees in each of the tested subjects including reading, writing, math, science, and history. Even when compared to other school districts with relatively large populations of disadvantaged students, RPS' performance on standardized tests falls well behind (see Figure 2).[4] It is striking to note, however, that when only looking at the reading performance of white students, RPS has a higher passing percentage than the state—88% compared to 85% (*Richmond City Public Schools: Assessments*, 2021).

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[2] According to VDOE guidelines, a student is considered economically disadvantaged if they meet one or more of the following criteria: 1) is eligible for Free/Reduced Meals; 2) receives TANF; 3) is eligible for Medicaid; or 4) is identified as either Migrant or experiencing homelessness (*VDOE : Student Records Data Definitions*, n.d.).

[3] It is worth comparing Virginia's overall performance on standardized tests to the rest of the nation. Because every state implements their own versions of standardized testing, one must rely on the National Assessment for Educational Progress (NAEP), which is administered by the National Center for Education Statistics (under U.S. Dept. of Education) to compare across states. According to the most recently available NAEP data, Virginia's student performance is on par or slightly higher than other states (*NAEP Reading Report Card: State Average Scores*, 2017).

[4] This graphic compares RPS' performance on Reading SOLs to other districts in Virginia whose student populations are over 60% disadvantaged, to RPS neighboring districts (including Chesterfield, Henrico, and Hanover) which have significantly lower populations of disadvantaged students, and to the overall state performance (Hudaskco, 2019).
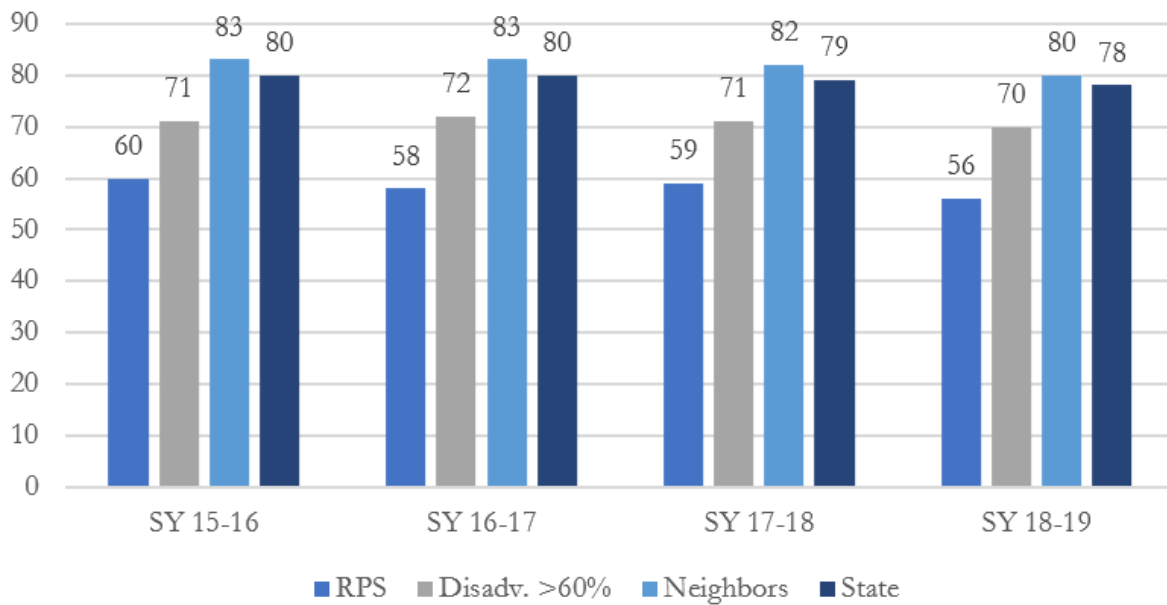
SOL Reading Pass Rates

Figure 2

The pattern of White RPS students performing at or above state average holds across all other tested subjects. Clearly, RPS has significant racial disparities in SOL performance. At the district level, this is partially driven by higher school-wide performance in the few schools that are predominately White in RPS. However, it is also driven by within-school racial disparities in performance (*Educational Opportunity and Outcome Equity Audit*, 2018). Furthermore, using public VDOE data for RPS schools, one can observe that there is a fairly strong negative correlation between the percentage of a school's population that is disadvantaged and that school's performance on both reading and math SOLs (*Richmond City Public Schools: Assessments*, 2021).[5]

RPS' underperformance extends beyond pass rates for state testing. According to PSAT data for SY 2017-18, only 10% of Richmond Public School students were classified as college and career ready in both ERW and Math. In that same year, Richmond Public School's four-year, on-time graduation rate was 75%. This is significantly lower than the Virginia state average of 92%. The post-secondary enrollment rate[6] of SY 2017-18 for RPS was 52%, compared to a state average of 67% (Hudaskco, 2019). This clear underperformance has negative implications for the students of RPS. Poor academic achievement has long-lasting ramifications both for individuals and for our broader society. These costs come in the form of lowered lifetime earnings, increased dependence on public support programs, lack of health insurance, and increased likelihood of

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[5] See Appendix B for a visualization.
[6] This rate measures post-secondary enrollment within 16 months of graduation from high school.

criminal activity (H. M. Levin et al., 2007; *The Graduation Effect: Every Student's Potential to Impact a Community (Richmond, VA)*, 2017).

RPS Financial Resources

Compared to its neighboring and peer school districts, it costs more to educate Richmond's student population.[7] This differential is driven largely by the fact that RPS students are more economically disadvantaged as compared to the Virginia average of 41% (*Virginia State Quality Profile*, 2021). In the schools that predominantly support economically disadvantaged children, RPS offers smaller class sizes which results in higher costs, mainly through increased staff needs. Additionally, many of the existing school buildings are small, which can be up to twice as expensive to operate as compared to larger sites (*RPS Budget Analysis: Full Report for Discussion*, 2016). Given these constraints, it is important that available resources are leveraged as efficiently as possible.

Richmond Public Schools receives funding from several different entities, including the federal government, the Virginia state government, the City of Richmond, and revenues from state sales taxes. In Virginia, the school district cost-share ratio between the state and the locality is determined by the Local Composite Index and the Local Required Effort (Thompson et al., 2019). The Local Composite Index accounts for the true value of real property, adjusted gross income, and taxable retail sales in each locality.[8] According to the adopted FY 2021 budget, Richmond City must appropriate 54.6% of the school district's budget that totals over $331 million (*School Board Adopted Budget FY2020-21*).

Within the RPS budget, the categories with the most allocation flexibility are: basic instruction, guidance programs, health services, school leadership, and finance & human relations—all within the General Fund, which primarily supports instruction personnel (*RPS Budget Analysis: Full Report for Discussion*, 2016). These are the functional areas where it is most feasible to investigate improved allocation structures and how they can be leveraged to increase student support. It is important to note that any potential misalignment in funding allocations is particularly impactful during this COVID-19 economic era.

RPS Teaching Resources

Richmond Public Schools engages in an annual staff 'leveling' process that reviews school staffing as a function of projected enrollment numbers. One primary objective is to ensure that RPS schools are operating

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[7] As of 2015, the average per-pupil revenue for RPS was $12,700 compared to an average of $10,500 for peer districts, including Norfolk, Newport News, and Portsmouth. A significant proportion of this $2,200 difference in revenue is provided for by the City of Richmond (*RPS Budget Analysis: Full Report for Discussion*, 2016).

[8] The Local Composite Index (LCI) is a weight-adjusted score that measures the fiscal capacity of a locality. It is comprised of the true value of property (.5), local adjusted gross income (.4), and local taxable retail sales (.1). The LCI then determines the Local Required Effort (LRE), which is the percentage of funding that must be provided by the local government. The LCI-LRE relationship utilizes a sliding scale so that less wealthy school divisions receive more state aid (Thompson et al., 2019).

in accordance to the standards set by VDOE. These standards typically set a maximum student-to-teacher ratio that varies depending on grade-level and subject. These state guidelines can be supplemented by district policies as well. In addition to these guidelines, many RPS schools are recipients of the VDOE Class Size Reduction Grant program that provides supplemental funding to lower CSRs in grades K-3. This program determines the target CSRs for each school based on the percentage of the student body that qualifies for free-and-reduced lunch (a common metric for economic disadvantage).

Outside of leveling policies with regard to CSR that primarily focus on issues of teaching resource quantity, the quality of the available resources is also important. As of SY 2018-19, 16.4% of teachers in RPS were classified as inexperienced, meaning that they had less than one year of teaching experience. However, a finer look at the data shows a large discrepancy in rates of inexperience between Title 1 and non-Title 1 schools.[9] Only 11.3% of teachers at non-Title 1 schools are classified as inexperienced as compared to 18% of teachers at Title 1 schools (*Richmond City Public Schools - Teacher Quality Data*, 2021).[10]

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[9] Title 1 is a federal supplemental funding source provided to schools with the highest concentrations of students in poverty.
[10] Reference Appendix A for more information on Richmond Public Schools, including school quality data, the district's current strategic plan, and information pertaining to finances.

LITERATURE REVIEW

RPS is by no means unique in its challenges. Lagging student achievement, particularly in low-resourced and high-need schools, has long been an issue for primarily urban school districts. Much of the policy and academic debate around how to address this problem focuses on the role of teachers and the impact that they can have on student performance. The debate on this topic hinges on the question of whether the quantity or quality of teachers is a stronger driver of student outcomes and whether or not one can be substituted for the other.

Teacher Quality

Nationally, districts struggle to allocate high-quality teachers equitably. While low-income schools tend to have more teachers, those teachers tend to be less qualified (Houck, 2010; Knight, 2019; Rubenstein et al., 2007). This has important implications for student outcomes as a growing body of research has shown that teacher qualifications significantly affect student learning (Adamson & Darling-Hammond, 2012). Economically-driven teacher quality research tends to focus on a teacher's value-add in terms of student achievement. Value-added measurements capture how much students learn in the course of a year. Hanushek and Rivkin's work to synthesize teacher effectiveness studies found that, on average, the students of teachers who are one standard deviation above the quality average scored 0.12 to 0.14 standard deviations higher on measures of achievement (Hanushek & Rivkin, 2010). Beyond student achievement on standardized tests, Raj Chetty et al. estimated that students who were taught by high-value-added teachers were more likely to attend college and earn higher salaries (Raj Chetty et al., 2014).

Many point to teacher recruitment as a key variable in the broader allocation process. Teacher recruitment and placement is driven by both candidates and school leadership. For teachers, it's not just about the pay. Research shows that candidates base their decisions off of several preferences including school poverty rates and locations (Boyd et al., 2013). Approaches to balancing teacher efficacy and/or experience across a district often focus on recruitment strategies to attract highly-qualified teachers to low-income schools. At the district level, potential policy solutions to boost equitable teacher allocation include creating alternative pathways to teacher certification, cultivating pipeline programs, altering financial incentives, and reforming human resources practices. Ideally, these methods are paired with retention efforts designed to keep recruited teachers in high-need schools where children are most likely to benefit from capable support.

Alternative Certification Programs provide a quicker path to the teaching profession than traditional collegiate routes; however, the evidence on these programs is mixed. An analysis of New York City students and teachers in grades 3-8 found that teachers entering from alternative pathways with reduced coursework

(like NY Fellows and Teach for America) often had smaller math and language arts gains for their students than their colleagues who had traditional university-based preparation. However, these differences tended to be small in magnitude and disappeared as teachers gained experience (Boyd et al., 2006). In-house credential programs are ACPs that recruit candidates who are already serving in a school district in another capacity. More so than other new teachers, these recruits tend to have lasting ties to the local community, which may counteract later attrition (Reed, 2018).

Pay features heavily in the academic discussion of teacher allocation, although there is mixed evidence on whether financial policy interventions boost recruitment for low-income schools. A study of schools and districts in New York state found that even-across-the-board salary structures were not likely to alleviate the inequitable distribution of high-quality teachers (Lankford et al., 2002). This is because such structures provide little incentive to teach in high-need schools where the work tends to be more demanding (Rubenstein et al., 2007). In answer, some advocate for incentive or "combat" pay for teachers working in low-income, high-need schools. Clotfelter et al. found that when teachers in higher poverty schools received an $1,800 bonus, the turnover rate decreased by 17% (Clotfelter et al., 2015). However, other researchers have found that combat pay has largely been unsuccessful in the recruitment space because the size of the bonuses are often insufficient to meet the underlying salary disparities between districts (Adamson & Darling-Hammond, 2012). Other financial incentives of various teacher recruitment programs include relocation reimbursement, specialized scholarships, housing subsidies, state income tax credits, and loan forgiveness. Focus groups of pre-service teachers and job scenario analyses have shown that financial incentives like these are attractive to candidates (Milanowski et al., 2009).

Furthermore, research has shown that teacher recruitment and allocation is often held up by human resource practices that delay the hiring process. Delayed hiring negatively affects teacher recruitment, retention and student achievement (Podolsky et al., 2019). Levin and Quinn's work showed that aggressive recruiting practices could increase the number of applicants in hard-to-staff urban districts. However, 35-60% of applicants withdrew from the hiring process because districts waited to make offers until mid-to-late summer. Most of the candidates who withdrew were more qualified, thus leaving the remaining pool more quality-shallow (J. Levin & Quinn, 2003). Such delays are caused in part by HR practices and collective-bargaining agreements that allow current teachers to provide late notice of intent to leave. Additionally, teacher transfer rights give senior teachers, who tend to be more qualified, the right to apply to vacancies before new hires. This has been linked to the concentration of less qualified teachers in high-need schools (Miller & Rubenstein, 2008).

Teacher Quantity

Many school districts, including RPS, have attempted to address inequitable distribution of teacher experience by having lower teacher-to-student ratios in low-income, high-need schools. The theory is that having fewer students makes classroom management easier and thereby lifts the burden on less-experienced teachers, which hopefully translates to increased student achievement. However, the available literature is not entirely clear on whether quantity of teaching resources is a sufficient replacement for the quality of those resources, especially given high rates of teacher turnover.

The Tennessee Student Teacher Achievement Ratio (STAR) experiment is a foundational causal study of the impact of reducing class size on a variety of student outcomes. This experiment, which was conducted in the late 1980s, randomly assigned students to small classes (15:1) or regular classes (22:1). Subsequent analyses of this experiment have found positive impacts on student performance and achievement metrics. Krueger's intent-to-treat analysis found that students in small classes scored 4 percentile points higher than students in larger classes after one year, with continued positive, but smaller sized effects accruing over the next several years. This study also found larger effects for minority and economically disadvantaged students (Krueger, 1999). Looking beyond the immediate impacts on student achievement, Raj Chetty et al. found that students who were randomly assigned to the smaller class sizes were more likely to attend college, as well as exhibit better savings and home ownership behaviors (R. Chetty et al., 2011).

Despite this strong evidence, subsequent CSR reduction studies have found mixed results and smaller effect sizes than those related to the STAR experiment. In the late 1990s, California instituted a K-3 CSR reduction program that capped class sizes at 20:1. Jepsen and Rivkin's analysis of the state-wide program found positive effects of student achievement as measured by test scores, but these effects were about half the size as those found in Tennessee (Jepsen & Rivkin, 2009). Studies focusing on the impact of CSR reductions in post-3rd grade classrooms tend to find no effect. A pre- and post-trend analysis of Florida's CSR reduction program implemented in the 2000s found no impact on test scores in grades 3 through 8 (Chingos, 2012). Additionally, a natural experiment based in Connecticut found no relationship between class size and student achievement in fourth and sixth grades (Hoxby, 2000).

One of the potential causes for the challenges seen in subsequent iterations and scaled projects is that teacher quantity and teacher quality are intimately linked. When a school district or state lowers its maximum CSR, it must then hire new teachers to staff additional classrooms. However, large scale hiring could mean that schools cannot be as selective in their hiring process and therefore hire less qualified or less experienced teachers. If this does occur, then CSR reduction policies might be decreasing the average quality of teachers within a district or school at the same time as it is increasing the quantity of teaching resources. There is some evidence that this occurred in the California program (Jepsen & Rivkin, 2009).

Despite mixed results, many states have continued to institute and operate CSR reductions. These policies are expensive and their application should be targeted towards the populations that are most likely to benefit from such interventions. Despite a somewhat murky literature, it does seem clear that these policies are most impactful for disadvantaged students in early grades (Whitehurst & Chingos, 2011).

Non-Teaching Staff Interventions

Student achievement and performance is also impacted by staffing decisions for non-teaching positions. Often, these supplementary positions are designed to help teachers be more effective in the classroom and to provide additional student support where needed. Perhaps one of the most well-known, although not well-studied, support role within schools is that of the instructional or teaching assistant. These staff members provide supplementary support to teachers and students. This aid can take the form of individualized student attention and organizational support, among other functions. Utilizing panel data from North Carolina, several researchers have found strong evidence that teaching assistants positively impacted test scores, particularly for minority students. Teaching assistants also reduced the rates of absenteeism and tardiness (Clotfelter et al., 2016; Hemelt et al., 2021). However, analyses of the Tennessee STAR experiment data have not found statistically significant evidence that students in class with a teaching aide perform better than students in regular classes without an aide (Finn & Achilles, 1990; Krueger, 1999).

Another non-teaching resource that school districts leverage to support teachers and students is instructional coaches. Instructional coaches are staff members who are responsible for supporting teacher development. They most often provide mentoring and professional development to classroom teachers and the individuals in these roles are often veteran teachers themselves. Coaching programs are designed to be individualized and sustained professional development opportunities that are context-specific and focus on skill development. Kraft et al. conducted a metanalysis of 60 causal studies that estimated the effect of instructional coaching programs on student achievement and teacher practice. They found pooled effect sizes of 0.49 SD on classroom instruction and 0.18 SD on measures of student achievement. However, the authors did find that the average effect sizes for larger programs were significantly smaller (Kraft et al., 2018). Marsh et. al examined the relationship between instructional coaching and data-driven decision making in Florida and found that coaches often help teachers understand and leverage data-driven insights to improve the quality of their teaching and boost student achievement (Marsh et al., 2010).

In Summary

School districts across the country struggle to improve student learning outcomes and many have considered a wide range of staffing models as a potential source of amelioration. Common models include ways to boost teacher recruitment and retention to staff highly-qualified teachers in low-income schools, reductions in CSRs to lift teacher burden, and the addition of support staff to serve in high-need contexts. That the

literature for these types of interventions remains largely mixed is perhaps indicative of the fact that each locality needs to tailor their approach to the realities of their individual district. Ideally, districts should seek to blend quality and quantity approaches in order to best ensure positive outcomes as these considerations are so intimately linked. In the RPS context where questions of teacher quality are not answerable at this time, attention should be paid to those quantity approaches that promise the greatest return on investment. Based on this review of the literature, this analysis will explore the following policy options: maintaining current staffing practices, reducing CSRs in low-performing elementary schools, and increasing instructional coaches in all low-performing schools.

CRITERIA

Each of the proposed alternatives in this analysis will be evaluated under the following criteria structure:

Cost-Effectiveness

The cost in the year of implementation for each alternative per anticipated change in the average SOL score (effectiveness). For standardization, effectiveness is measured in terms of standard deviations.

Equity

The degree to which each alternative ensures that a staffing resource is distributed according to the different challenges facing schools. Alternatives will be rated using a point system. Points will be awarded according to the number of equity categories an alternative addresses at each level of education (elementary and secondary). Categories include socioeconomic, racial, and, historic underperformance. Point assignment will also consider the degree to which each alternative promotes equitable allocation.

Administrative Feasibility

The number of roughly equivalent steps it takes for each alternative to be successfully implemented and maintained. The number of steps will be the direct score for this criterion.

How each alternative performs on each criterion will inform the outcomes matrix, which will be used to identify the optimal policy recommendation for Richmond Public Schools. These criteria have been weighted in order to reflect their relative importance in the decision-making process. Equity receives the highest weight at 0.5 because equity concerns are the primary driver of this analysis. The Office of School Planning and other RPS entities wish to emphasize the role of equitable schooling so as to provide students with more even outcomes that best prepare them for life outside of the school system. Additionally, this weighting reflects the emphasis on equity that is seen in RPS' most recent strategic plan. Cost-Effectiveness receives a weight of 0.3 because RPS must ensure that it is leveraging its available resources for projects and programs that will deliver positive student outcomes. And finally, Administrative Feasibility has been given a weight of 0.2 because while it is an important consideration for each of the following policy options, it is not the primary concern.

ALTERNATIVES

The following policy options are proposed for RPS' consideration. These alternatives have been put forward based on options identified through the literature review process and according to guidance from the client. Each alternative section will provide a brief overview of the option before assessing it according to the criteria presented above.

Alternative 1: Maintain the Status Quo

Under this option, Richmond Public Schools would continue their current approaches to allocating teaching and non-teaching staff across the district. This means that principals and principal directors maintain a high level of influence over this process so long as they are in compliance with state and grantee guidelines. These guidelines primarily set student to staff ratios that inform staff allocation. Under the status quo, teaching staff resources will continue to be leveled with regard to enrollment projections and applicable guidelines.

Cost-Effectiveness

In order to estimate the effect of maintaining the status quo, this analysis assumes that current trends in average student performance for both math and reading will continue. RPS' average SOL score for reading has declined by -1.9 points (-.032 SD) over the past five years. For math, this decline has been slightly steeper at -2.55 points (-.043 SD). Therefore, if present trends continue under the status quo option, RPS' SOL scores will fall by an average of -.038 SD per year.[11] The cost estimate for this option is relatively small as it accounts only for administrative maintenance time specifically related to leveling.[12] The overall cost-effectiveness estimate for maintaining the status quo is approximately -$8,350 per a 0.1 SD change in SOL scores.

Equity

Under the status quo, Richmond Public Schools will continue its current allocation pattern, which relies primarily on leveling teachers according to state standards. These standards are solely determined by class enrollment numbers within a school. They do not systematically account for differential challenges that some student bodies face. For example, they do not look at demographics like socio-economic status, nor do they

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[11] This trend estimate was converted to SDs using the only publicly available SOL technical document (*Virginia Standards of Learning Assessments Technical Report: 2014-2015 Administration Cycle*, n.d.) that reports on SDs for a select number of exams. The reported SDs were averaged.

[12] See Appendix D for a fuller explanation of the underlying calculations.

consider whether a school is high-need based on its record of achievement. Therefore, this alternative would score well on an equality criterion because it generally treats all schools equally relative to their population size. However, this analysis focuses on issues of equity instead. Where the status quo does consider issues of equity is through the CSR K-3 program; however, there remains significant variance in allocation even among the participating schools. In sum, this alternative earns a half point each for socioeconomic and racial equity at the elementary level because these two are intimately linked within RPS. Half points were assigned because there is still a large degree of discretion allowed under this process which deflates its equitable impact. Therefore, the total equity score for the status quo option is 1.0.

Administrative Feasibility

While maintaining the status quo does not incur any novel action steps, the current staffing model does require yearly maintenance. This will result in an estimated two steps (see below). Therefore, this alternative receives an administrative feasibility score of 2.

Step #	Description
1	Regularize the staffing report process; update the positions matrix and enrollment projections infrastructure accordingly
2	Engage in annual leveling process with hiring managers

Alternative 2: Alter Class Size Ratio Guidelines in Low-Performing Elem. Schools

The guidelines dictating class-size ratios in RPS come from two sources. The first are VDOE guidelines that set maximum CSRs between 21:1 and 25:1 depending on the grade level. Secondly, the majority of elementary schools in RPS are currently operating their K-3 grades under a maximum class-size ratio of 19:1 in order to meet the requirements of a substantial supplementary grant, as discussed before. However, there is substantial variation of actual CSRs between schools that are participating in the CSR reduction grant. These differences exist largely without systematic quantitative reasoning or evidence. This creates an accountability issue and also leads to distortions in the local teaching job market because schools that are operating at higher CSRs have trouble attracting teachers who could work at schools operating at lower CSRs. There may well be very valid reasons that certain schools have lower CSRs—for example, history of low-performance, high rates of disadvantaged students, etc.—however, the process for how additional teachers are allocated is currently very murky.

This alternative calls for Richmond Public Schools to adopt standardized business rules that clarify which schools will operate on lowered CSR guidelines. These business rules should be developed based on quantifiable evidence of need i.e., performance on standardized tests and the percentage of disadvantaged students enrolled in each school. This will provide justification for necessary distortions and also work to more accurately target limited resources to the schools and students who stand to benefit the most. The development of these guidelines should focus on the elementary level because that is where we observe the most variance in allocation and because elementary education sets the foundation for all future learning so interventions targeted here are can be particularly powerful.

Practically speaking, RPS could begin this process by setting a K-3 maximum CSR of 15:1 for elementary schools whose average SOL pass rates for math and reading are below 60%.[13] In order to meet these lowered CSRs, new teachers will have to be hired to fill the positions created at these elementary schools. RPS should consider leveling so that all schools not under this threshold have their CSRs maximized to the appropriate level (19:1 or 24/25:1), depending on their enrollment projections. This would provide large cost savings because it would decrease the number of new hires needed as existing teachers may be transferred. However, for the sake of analyzing this alternative at this time, this measure has not been included due to political feasibility issues.

Cost-Effectiveness

The Tennessee STAR experiment offers the most robust estimates of the effect of reducing class size on student achievement outcomes. The STAR experiment randomly assigned students to a small class (ratio between 13:1 and 17:1) and regular class sizes (ratio between 22:1 and 25:1). Subsequent analysis of this experiment found that students in smaller classes scored on average 0.22 standard deviations (5 to 7 percentage points in the Tennessee context) higher on standardized tests than did students in regular classes (Krueger, 1999). Of course, these numbers are unlikely to map perfectly onto the RPS context, and this alternative does not call for reducing the CSR by the full magnitude of the STAR reduction. Therefore, for the sake of estimating the cost-effectiveness of this alternative in the RPS context, this analysis assumes an effect on the low-end of these results at 0.10 standard deviations.[14] This assumption is made on the basis that this alternative's CSR reduction is smaller in magnitude than the STAR experiment's reduction. Additionally, other CSR studies of smaller reductions have found smaller effects suggesting that the relationship between reduction and performance is not linear.

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[13] This threshold is based on district averages over the past several years, which have generally hovered around this threshold, and also on the targets set by RPS' most recent strategic plan.

[14] For context, average SOL scores for RPS have decreased at a rate of -.038 SD per year over the past five years.

The cost estimate for this alternative is largely driven by the additional personnel costs associated with hiring new elementary teachers at the schools effected by the new CSR guidelines. According to the 2018/2019 SOL scores, there are 10 schools that meet this suggested criterion.[15] Within those schools, 43.5 FTEs would need to be brought on in order to meet the reduced class-size policy.[16] The total cost estimate of this alternative is approximately $2.7 million.[17] Therefore, this alternative's cost-effectiveness is $2.7 million per 0.1 SD increase in the average SOL score.

Equity

This alternative provides additional resources to a target subsection of schools based on their level of need (i.e. their poorer record of student performance). Therefore, this approach seeks to use available information to more equitability distribute RPS resources. This conclusion is also bolstered by the fact that in RPS, there is a correlation between the percentage of a school's student body that is economically disadvantaged and its SOL pass rates in both reading and math. Therefore, on average, schools that are poorer performing and would benefit from decreased CSRs also tend to be more socioeconomically disadvantaged. Therefore, this option receives one point each for socioeconomic and racial equity at the elementary level. It also receives an additional point because it considers historic student underperformance in its allocation structure. In conclusion, this alternative receives a score of 3.0 for the equity criterion.

Administrative Feasibility

This alternative will involve a reorganization of budget and staff. This implementation process will result in an estimated seven steps (see below). Therefore, this alternative receives a score of 7 for the administrative feasibility criterion.

Step #	Description
1	Gain approval from district leadership
2	Develop standardized business rules for maximum CSRs dependent on quantifiable evidence
3	Identify elementary schools that will be targeted by CSR changes
4	Reallocate staff salary budgets accordingly
5	Hire additional staff at under-allocated schools
6	Regularize the staffing report process; update the positions matrix and enrollment projections infrastructure accordingly
7	Engage in annual leveling process with hiring managers, emphasizing business rules

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[15] See Appendix C for a list of these schools.
[16] This number is calculated using SY 2020-21 Actual Staffing not SY 2021-22 Projected Staffing.
[17] See Appendix D for a fuller explanation of underlying cost calculations.

Alternative 3: Increase Instructional Coaches in Low-Performing Schools

This alternative falls somewhat between the quality and quantity of teachers debate. Instructional coaches are staff members who are responsible for supporting teacher development. They most often provide mentoring and professional development to classroom teachers. Coaches typically observe teachers, identify areas for improvement, and then provide teachers with new, evidence-based techniques or practice in order to boost teacher efficacy. The theory of action for this coaching model is that by providing small-group and/or one-on-one professional development opportunities, instructional coaches will enable classroom teachers to improve their skills, delivery, and content. This improvement will drive advances in student achievement.

RPS currently employs 38 instructional coaches in a fairly even pattern across the district for the elementary level, but is more sporadic at the secondary level. Currently, the average student-to-instructional coach ratio at the elementary level is approximately 270:1 and at the secondary level it is 650:1. Under this alternative, schools whose average SOL pass rates for math and reading are both below 60% would receive additional instructional coaches. The guideline suggestion put forth in this analysis is that schools below this threshold operate on a maximum ratio of 180:1 at the elementary level and 430:1 at the secondary level.[18]

In order to make sure that instructional coaches are providing the most impact possible, this alternative would also require that teachers have the time and incentive to engage with instructional coaches. Therefore, a set, rotating schedule of required coaching sessions should be implemented. Teachers should also be provided with information on the utility of instructional coaching in order to enhance buy-in. Principals should be provided with a set of evidence-based best practices (like appropriate time-use, content-focused coaching, etc.) that would allow them to create a program that best fits the needs of their school.

Cost-Effectiveness

A metanalysis of the available literature on the efficacy of instructional coaches seems to provide the best available estimate of how these staff positions influence student performance. In this metanalysis, the authors estimated that coaching programs increased student achievement on state standardized tests by 0.12 standard deviations. Content-specific coaching models produced slightly higher results (Kraft et al., 2018). With this information, this analysis assumes 0.12 SD as a baseline.[19]

The costs of this alternative are largely in two veins: additional personnel costs for new instructional coaches and time-use costs for trainings and administration of the policy. There are 17 RPS schools that meet the

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[18] These changes were calculated based on the target of increasing current allocation for effected schools by 1.5 on average.
[19] Again, average SOL scores for RPS have decreased at a rate of -.038 SD per year over the past five years.

SOL criterion set by this alternative as of SY 2018/2019 test results.[20] Among those schools, 21.5 FTE instructional coaches would need to be hired.[21] The total cost estimate for this alternative is $2.1 million.[22] Therefore, this alternative's cost-effectiveness score is $1.8 million per 0.1 SD increase in the average SOL score.

Equity

This alternative provides a subsection of RPS schools with additional instructional coaches if those schools meet the school performance threshold. Therefore, this alternative targets resources based on demonstrated need. Again, the equity score of this alternative is boosted by the fact that school performance and student disadvantage are correlated, meaning that schools that would receive additional instructional coaches often have higher proportions of disadvantaged students. This alternative would apply new staffing guidelines to both elementary and secondary schools which would serve to minimize the misallocation of instructional coaches across the district from an equity point of view. Accordingly, this option receives one point each for socioeconomic, racial, and historic underperformance at both the elementary and secondary levels. Therefore, this alternative receives a score of 6.0 for the equity criterion.

Administrative Feasibility

Once again, this alternative requires budget and staff reorganization that will result in an estimated nine steps to implement (see below). Therefore, this alternative receives an administrative feasibility score of 9.

Step #	Description
1	Gain approval from district leadership
2	Identify elementary & secondary schools to receive more coaches
3	Get necessary budget change and/or offset approved and implemented
4	Train principals in best practices for instructional coaching programs
5	Hire additional instructional coaches
6	Provide teachers with training on the utility of instructional coaching
7	Institute the requirement that teachers meet regularly with their assigned instructional coach
8	Regularize the staffing report process; update the positions matrix and enrollment projections infrastructure accordingly
9	Engage in annual leveling process with hiring managers

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[20] A list of these schools is available in Appendix C.
[21] This number is calculated using SY 2020-21 Actual Staffing not SY 2021-22 Projected Staffing.
[22] See Appendix D for a fuller explanation of the underlying cost calculations.

OUTCOMES MATRIX

Criteria	Weight	Alt 1: Status Quo	Alt 2: CSR Reduction in Elem.	Alt 3: Instructional Coaches
Cost-Effectiveness (Score)	0.3	-$8,350	$2.7 Million	$1.8 Million
Equity (Score)	0.5	1.0	3.0	6.0
Admin. Feasibility (# of Steps)	0.2	2	7	9

RECOMMENDATION

At this time, the recommendation of this analysis is that Richmond Public Schools and the Office of School Planning adopt **Alternative 3: Increasing Instructional Coaches in Low-Performing Schools**. This recommendation places emphasis on providing improvements to student performance while trying to distribute RPS resources in a more equitable manner that prioritizes the schools most in-need. Of the two alternatives that offer potential improvements on student SOL performance, the instructional coaching model seems to deliver greater returns for less cost. Another factor in this decision is that this alternative also attempts to cover both sides of the quality versus quantity debate concerning teaching resources. It increases the quantity of instructional coaches, but the purpose they serve within a school is to help teachers improve their quality of instruction. This alternative increases the likelihood of positive impact for low-income, high-need schools in RPS.

IMPLEMENTATION

At the beginning of this implementation section, it is useful to revisit the steps that were previously laid out when assessing the administrative feasibility of increasing the number of instructional coaches in low-performing schools:

Step #	Description
1	Gain approval from district leadership
2	Identify elementary & secondary schools to receive more coaches
3	Get necessary budget change and/or offset approved and implemented
4	Train principals in best practices for instructional coaching programs
5	Hire additional instructional coaches
6	Provide teachers with training on the utility of instructional coaching
7	Institute the requirement that teachers meet regularly with their assigned instructional coach
8	Regularize the staffing report process; update the positions matrix and enrollment projections infrastructure accordingly
9	Engage in annual leveling process with hiring managers

The implementation of this alternative is beholden to the first step: gaining approval from district leadership. It is undeniable that any policy option that requires increased staffing will come with a significant cost and therefore must be endorsed and approved by top school leadership, like the superintendent and the chief officers, as well as the RPS School Board. The outlook for approval is somewhat positive. RPS' most recent strategic plan names two goals that this policy option would support. First, RPS wants to increase its overall SOL pass rate by 4 percentage points (to 68%) in both reading and math by SY 2022-23. Second, RPS has also named equity as a focus of its operations by setting the goal of decreasing gaps in student performance across racial groups and socioeconomic status (Hudaskco, 2019).

Outside of these stated commitments, the current moment provides a unique opportunity to implement this type of policy option. Increased school funding as a result of the federal COVID-19 response has eased school budget burdens and may provide space to absorb some of cost impact of this policy change. Of course, this funding is temporary, but may help the district overcome initial implementation financial concerns. Additionally, public support for interventions like this one is likely to be higher than usual. Over the past year, concern around how online learning has impacted student academic growth has continued to augment. It is clear that teachers and students will face large hurdles as they readjust to in-person learning. In these unprecedented times, teachers will need enhanced support structures. Particularly, schools would likely benefit from having instructional coaches who can stay abreast of best practices for learning recovery

and deliver this information to their teachers as quickly as possible. This need should improve the outlook for approval.

Once district leadership approves this policy change, the School Planning team and other implicated offices need to finalize the precise formula to be used for selecting the disadvantaged schools that will receive increased instructional coaching staff and make budgetary and business rule changes as necessary. For the sake of analyzing this alternative, this analysis has suggested a 60% pass rate threshold, but this guideline is open to change and RPS should consider where it would like to target these resources to support the students who would benefit the most.

After the criteria have been set and these technical adjustments have been made, it is vital to the success of this intervention that principals are provided with training on how to best utilize these resources. Principles should be provided with a set of evidence-based best practices as it concerns coaching. This includes information on the time-use patterns of impactful coaches and the importance of focusing coaching sessions on content (Desimone & Pak, 2017; Johnson, 2016; Kane & Rosenquist, 2019). This information should be delivered prior to hiring new staff in order to give principles time to create a program that best fits the needs of their school and make hiring decisions according to that framework.

After new instructional coaches have been hired, work must be done to enhance teacher buy-in and participation with this program. From a practical point of view, teachers should be mandated to meet with an instructional coach, ideally the same coach, for at least 2 hours per month. The goal is to ensure that teachers feel invested in this process, not that it is just another bureaucratic task to fulfill. To that means, teachers should receive in-depth training that covers how coaches are to serve only as a growth tool and that their evaluations will not be used for punitive purposes. This training would be an opportune time to introduce new coaches to the school staff. Teachers should also be given evidence as to how coaching sessions can positively impact their practice. Following this stage, implementation should focus on getting the schedule of sessions off to a strong start and regularizing the leveling process as it concerns instructional coaches for future years.

In sum, providing additional instructional coaches to RPS schools that are struggling to support student performance has a fairly clear implementation path and the need for increased teacher support in this moment is evident. Thinking beyond primary implementation, it is worth thinking about how the district should evaluate the efficacy of employing instructional coaches going forward. Future considerations might include developing a system for assessing teacher efficacy and identifying growth areas. Such a system would not only allow the district to understand the impact of instructional coaching, but would also provide coaches with additional data that could allow them to better identify areas of improvement for individual teachers, which would then feed back into improved coaching.

APPENDIX

A: Helpful Resources

RPS School Profile Data

https://schoolquality.virginia.gov/divisions/richmond-city-public-schools#desktopTabs-2

RPS Strategic Plan

https://www.rvaschools.net/dreams4rps
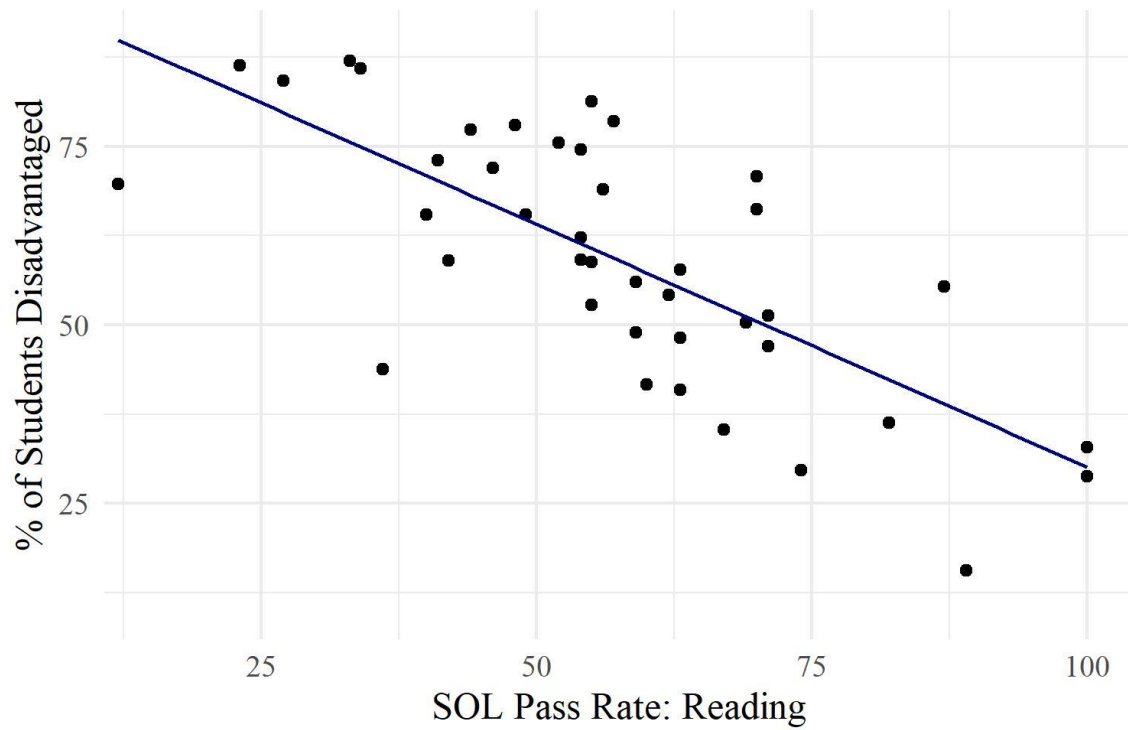
RPS FY 2020-21 Budget

https://www.rvaschools.net/cms/lib/VA02208089/Centricity/Domain/2074/FY21%20SCHOOL%20BOARD%20ADOPTED%20BUDGET.pdf
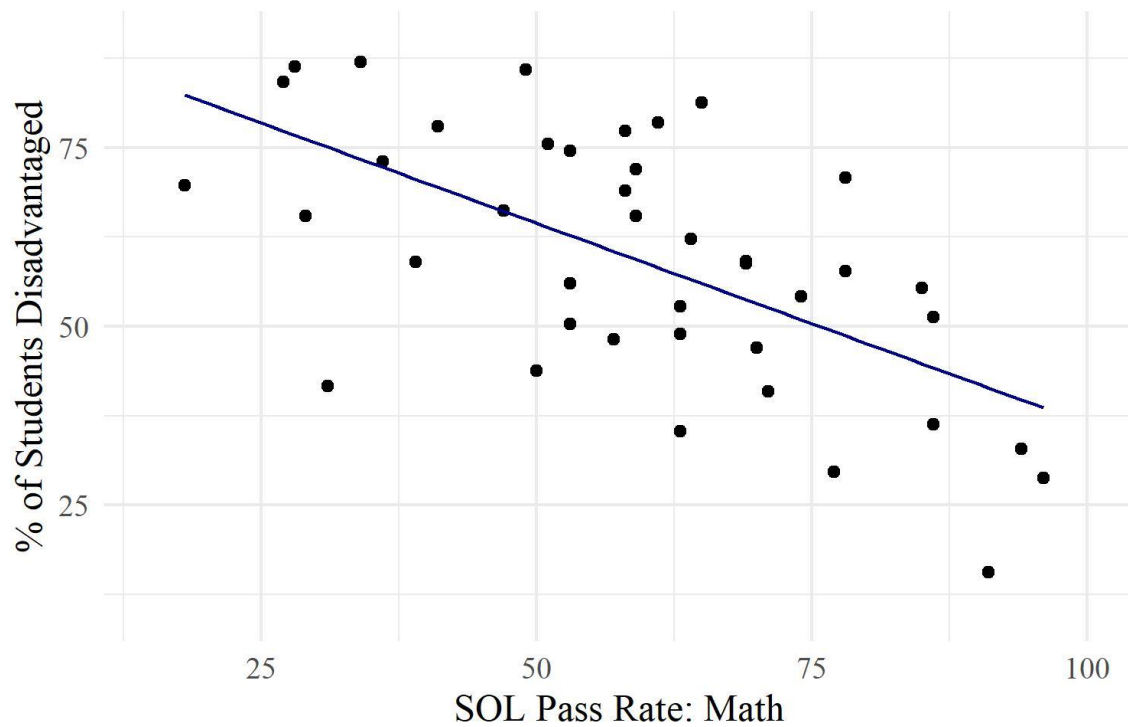
RPS Pay Scale

https://www.rvaschools.net/cms/lib/VA02208089/Centricity/Domain/822/RPS%20Salary%20Schedule%20FY21.pdf

B: Performance & Disadvantage Visualizations

Performance & Disadvantage: RPS Schools

Performance & Disadvantage: RPS Schools

C: Affected Schools

The following schools are those impacted by the guidelines provided in this report for the purposes of alternative analysis. These guidelines are suggestions that should be reviewed and are subject to change.

Schools Effected by Alternative 2: CSR Reductions

- Blackwell Elementary
- Cardinal Elementary
- Chimborazo Elementary
- Fairfield Court Elementary
- George W. Carver Elementary
- Miles Jones Elementary
- Oak Grove/Bellemeade Elementary
- Swansboro Elementary
- Westover Hills Elementary
- Woodville Elementary

Schools Effected by Alternative 3: Increased Instructional Coaches

- Armstrong High
- Blackwell Elementary
- Cardinal Elementary
- Chimborazo Elementary
- Fairfield Court Elementary
- George W. Carver Elementary
- George Wythe High
- Henderson Middle
- Lucille M. Brown Middle
- Miles Jones Elementary
- Oak Grove/Bellemeade Elementary
- River City Middle
- Swansboro Elementary
- Thomas C. Boushall Middle
- Westover Hills Elementary
- Woodville Elementary

D: Costing Calculations

Alternative 1: Status Quo

	Total Cost	$3,130.40		

	Subtotal Cost	Unit Cost	Units Needed
<u>Administrative Costs</u>			
Administrator Time - Implementing Current Guidelines	$3,130.40	$39.13	80

Administrator Time - Implementing Current Guidelines	Unit Cost = Salary ($81,391) / Days (260) / Hours (8) Units Needed = # of Hours Needed to Complete

Alternative 2: Reducing CSRs in Low-Performing Elementary Schools

	Total Cost	$2,666,875.12		

	Subtotal Cost	Unit Cost	Units Needed
<u>Administrative Costs</u>			
Administrator Time - Creating Guidelines	$782.60	$39.13	20
Administrator Time - Implementing Guidelines	$3,130.40	$39.13	80
<u>Personnel Costs</u>			
New Elementary Teachers	$2,658,981	$61,126	43.5
Human Resources Costs	$3,981	$22.88	174

Administrator Time - Creating Guidelines	Unit Cost = Salary ($81,391) / Days (260) / Hours (8) Units Needed = # of Hours Needed to Complete
Administrator Time - Implementing Guidelines	Unit Cost = Salary ($81,391) / Days (260) / Hours (8) Units Needed = # of Hours Needed to Complete
New Elementary Teachers	Unit Cost = Salary Units Needed = # of new teachers
Human Resources Costs	Unit Cost = Salary ($47,599) / Days (260) / Hours (8) Units Needed = 4 (Avg. Hours Per Position Hired) * 43.5 (# of Positions Hired)

Alternative 3: Increasing Instructional Coaches in Low-Performing Schools

	Total Cost	$2,151,408.28	

	Subtotal Cost	Unit Cost	Units Needed
Administrative Costs			
Elem. Principal Training Time	$1,333.44	$55.56	24
Middle Principal Training Time	$1,016.32	$63.52	16
High Principal Training Time	$537.84	$67.23	8
Teacher Training Time	$69,371.20	$38.20	1816
Administrator Time - Creating Guidelines	$782.60	$39.13	20
Administrator Time - Implementing Guidelines	$3,130.40	$39.13	80
Personnel Costs			
New Instructional Coach Salaries	$1,448,928.00	$67,392.00	21.5
Human Resources Costs	$1,967.68	$22.88	86
In-Practice Costs			
Teacher Time	$624,340.80	$38.20	16344

Elem. Principal Training Time	Unit Cost = Salary ($115,569) / Days (260) / Hours (8) Units Needed = # Principals (6) * # of Hours per Principal (4)
Middle Principal Training Time	Unit Cost = Salary ($132,128) / Days (260) / Hours (8) Units Needed = # Principals (4) * # of Hours per Principal (4)
High Principal Training Time	Unit Cost = Salary ($139,841) / Days (260) / Hours (8) Units Needed = # Principals (2) * # of Hours per Principal (4)
Teacher Training Time	Unit Cost = Salary ($61,126) / Days (200) / Hours (8) Units Needed = # of Teachers Participating (908) * Hours Needed (2)
Administrator Time - Creating Guidelines	Unit Cost = Salary ($81,391) / Days (260) / Hours (8) Units Needed = # of Hours Needed to Complete
Administrator Time - Implementing Guidelines	Unit Cost = Salary ($81,391) / Days (260) / Hours (8) Units Needed = # of Hours Needed to Complete
New Instructional Coach Salaries	Unit Cost = Salary Units Needed = # of new ICs
Human Resources Costs	Unit Cost = Salary ($47,599) / Days (260) / Hours (8) Units Needed = 4 (Avg. Hours Per Position Hired) * 21.5 (# of Positions Hired)
Teacher Time	Unit Cost = Salary ($61,126) / Days (200) / Hours (8) Units Needed = # of Teachers (908) * # of Hours per Month (2) * # of Months (9)

Notes on Costing Calculations:

Cost assumptions are derived from the RPS 2020/2021 Pay Scale (*Talent Acquisition / Salary Schedule*, 2020). Where applicable, this analysis assumed the salaries according to the modal Grade and Step 18. The units needed were estimated in consultation with RPS staff. All staffing calculations were based on SY 2020-21 actual staffing and enrollment numbers, not projections for SY 2021-22.

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