Fairfax County PUBLIC SCHOOLS
ENGAGE • INSPIRE • THRIVE

# STUDY OF TEACHING AND LEARNING DURING THE COVID 19 PANDEMIC

*Analyses of Q1 Secondary Marks*

**Office of Research and Strategic Improvement**

**November 2020**

# Introduction

Fairfax County Public schools began school year (SY) 2020-21 on September 8, 2020 by providing instruction to students virtually. During Quarter 1 (Q1), which ended on October 30, 2020, FCPS brought small cohorts of students with the highest need for in-person instruction into buildings but the large majority of students continued to receive instruction virtually throughout the quarter. As a part of the Office of Research and Strategic Improvement (ORSI) study of FCPS' teaching and learning efforts during the COVID 19 pandemic (formerly called the Distance Learning Study), analyses were conducted to monitor student performance during Q1. Specifically, ORSI explored Q1 student marks from SY 2020-21 to Q1 performance in prior years. The release of these analyses prior to completion of the full mid-year study report (scheduled for February 2021) follows on the heels of concerns locally and at the state and national level that student performance may be lower during the current year, when virtual instruction is prevalent, than in past years when in-person instruction was the norm.

# Data and Analytic Approaches

The main question of interest in the analyses presented in this report is to what extent student performance in Q1 of the current year differed from past student performance in Q1. To answer this question, Q1 marks for all students in middle and high school courses were extracted from the FCPS Student Information System (SIS) by Department of Information Technology staff and supplied to ORSI. DIT staff extracted the Q1 SY 2020-21 data from SIS on November 11, 2020, the day after teachers' due date for Q1 marks.[1]

ORSI analyzed the marks data in five ways, summarized in Table 1. Each analytic method investigated potential differences in student marks between the current and prior years. Table 1 describes the strengths and challenges of each analysis in understanding potential student performance changes related to FCPS needing to provide instruction virtually to most students received during Q1 of SY 2020-21. Generally, the strengths and challenges of the analyses revolve around the scope of students and marks that could be included versus the quality of the comparison (i.e., controls for student and course differences across years being compared). Some analyses also zero in on satisfactory (mark of C or above) / unsatisfactory (mark of C- or below) marks versus whether all marks were higher or lower than what would be expected.[2] Synthesized results from all three analyses frame the conclusions drawn at the end of the report.

**Table 1: Analytic Approaches**

| Analysis | Strengths | Challenges |
|---|---|---|
| 1. Compared the percent of students receiving two or more failing marks[3] in SY 2019-20 Q1 to SY 2020-21 Q1 | • Includes marks across all courses and content areas<br>• Includes all available marks for all students | • Compares two different groups of students without controlling for differences between them<br>• Does not control for differences in courses (content areas, rigor) |
| 2. Determined the extent to which the relation in marks between SY2019-20 and SY2020-21 is similar to the relation in marks between SY2018-19 and SY2019-20 | • Controls for differences due to changes in rigor of courses<br>• Controls for differences in student populations across years<br>• Accommodates possibility of different patterns by content area | • Currently focused on English and Mathematics<br>• Requires students to be in membership for two years to be included in the analysis |

[1] Changes or corrections to marks after this date are not captured in these analyses but are expected to be small.
[2] The separation of satisfactory and unsatisfactory marks was based on the general practice that students need to maintain a GPA of 2.0 to have satisfactory marks to participate in sports and other extracurricular activities.
[3] The criteria of a mark of F in two or more classes was selected to match the data requested by the Virginia Department of Education for reporting at the end of Q1 for SY 2020-21 compared to SY 2019-20.

| Analysis | Strengths | Challenges |
|---|---|---|
| 3. Determined the extent to which students are over- or underperforming in Q1 SY 2020-21 based on prior performance and course rigor | • Controls for differences due to changes in rigor of courses<br>• Controls for differences in student populations across years<br>• Accommodates possibility of different patterns by content area | • Conducted only on English and mathematics marks<br>• Requires students to be in membership for two years to be included in the analysis |
| 4. Determine the extent to which the relation in marks between SY2019-20 and SY2020-21 differs from the relation in marks between SY2018-19 and SY2019-20 and whether the relation varies by whether performance is above or below a 'C' | • Controls for differences due to changes in rigor of courses<br>• Controls for differences in student populations across years<br>• Accommodates possibility of different patterns by content areas<br>• Identifies patterns by performance level (satisfactory / unsatisfactory) | • Conducted only on English and mathematics marks<br>• Requires students to be in membership for two years to be included in the analysis |
| 5. Determine the extent to which the probability of passing a course is associated with prior performance, course rigor, and school year. | • Controls for differences due to changes in rigor of courses<br>• Controls for differences in student populations across years<br>• Accommodates possibility of different patterns by content areas | • Conducted only on English and mathematics marks<br>• Requires students to be in membership for two years to be included in the analysis |

# Findings

## Analysis 1

The first set of analyses compared the Q1 performance of all students in all middle and high school courses in SY 2019-20 to Q1 performance in SY 2020-21. This approach adjusts for neither the differences in the student population between the two years, nor potential differences in the courses taken by students or the rigor of those courses.

The analyses indicated that the percentage of students with 2 or more unsatisfactory marks at the end of Q1 increased in SY 2020-21 for all student groups when compared to SY 2019-20 Q1 marks. Overall, F marks increased from 6 percent of the all marks to 11 percent of all marks, an 83 percent increase. The amount of increase among racial/ethnic, gender, and other student groups was highest among Students with Disabilities (111 percent increase), and English learner (106 percent increase) students and lowest among Black (63 percent increase) and White students (67 percent increase). Nonetheless, all groups showed increases in the percentage of F marks received during Q1 of the current year as compared to the prior year, indicating that more students were failing courses during the (primarily) virtual instruction period than had occurred when instruction was delivered in-person.

**Table 2. Percentages of All FCPS Students with Marks of F in 2 or More Classes Overall and By Student Group, SY 2019-20 Q1 Compared to SY 2020-21 Q1**

| Student Group | Q1 2019-20 Percent and Count | Q1 2020-21 Percent and Count | Change |
|---|---|---|---|
| All Middle and High School Students | 6% n=5359 | 11% n= 9698 | 83% increase |
| Male Students | 7% n=3414 | 14% n=6183 | 100% increase |
| Female Students | 4% n=1891 | 8% n=3461 | 100% increase |
| Asian Students | 2% n=420 | 4% n=719 | 100% increase |
| Black Students | 8% n=768 | 13% n=1147 | 63% increase |
| Hispanic Students | 13% n=3028 | 25% n=5939 | 92% increase |
| White Students | 3% n=914 | 5% n=1495 | 67% increase |
| Students with Disabilities | 9% n=1174 | 19% n=2321 | 111% increase |
| English learner students | 17% n=1999 | 35% n=3777 | 106% increase |
| Economically disadvantaged students | 12% n=3060 | 22% n=5039 | 83% increase |

Tables 3 and 4 present this same information disaggregated for middle and high school students, respectively. The amount of increase in two or more Fs was significantly greater for middle school students (300 percent) than for high school students (50 percent). Additionally, the amount of increase in F marks was greater for all subgroups at the middle school level (all increases greater than 100%) than the high school level (all increases less than 100%). At the middle school level, the greatest increases in the percentage of students with two or more F marks were among female students (600 percent increase), Hispanic students (400 percent increase), Students with Disabilities (400 percent increase), English learner students (383 percent increase) and economically disadvantaged students (375 percent increase). Within the middle school level, data was also disaggregated to consider potential differences between seventh and eighth graders that might indicate greater issues among students transitioning between school levels. However, the data show this not to be the case with the percentage increases lower among seventh (300 percent increase) than for eighth graders (350 percent increase).

**Table 3. Percentages of FCPS Middle School Students with Marks of F in 2 or More Classes Overall and By Student Group, SY 2019-20 Q1 Compared to SY 2020-21 Q1**

| | Q1 2019-20 Percent and Count | Q1 2020-21 Percent and Count | Change |
|---|---|---|---|
| Middle School Students | 2% n=539 | 8% n=2488 | 300% increase |
| Male Students | 3% n=378 | 10% n=1591 | 233% increase |
| Female Students | 1% n=161 | 6% n=897 | 600% increase |
| Asian Students | 1% n=35 | 3% n=145 | 300% increase |
| Black Students | 3% n=92 | 9% n=283 | 200% increase |
| Hispanic Students | 4% n=318 | 20% n=1698 | 400% increase |
| White Students | 1% n=82 | 3% n=271 | 200% increase |
| Students with Disabilities | 3% n=122 | 15% n=674 | 400% increase |
| English learner students | 6% n=212 | 29% n=1163 | 383% increase |
| Economically disadvantaged students | 4% n=391 | 19% n=1660 | 375% increase |
| 7th grade Students | 2% n=222 | 8% n=1085 | 300% increase |
| 8th grade Students | 2% n=284 | 9% n=1208 | 350% increase |

At the high school level, the greatest increases were found for English learner students (70 percent increase), male students (67 percent increase), Asian students (67 percent increase), Students with Disabilities (67 percent increase), and Hispanic students (65 percent increase). Data were also broken out by grade level to look for any particular challenges for ninth graders compared to other grade levels that could signal transition issues among students. As with middle school, ninth graders had lesser increases in the amount of students with two or more failing marks (44 percent increase vs. 56, 63, 50 percent increases among tenth, eleventh, and twelfth graders, respectively), indicating virtual transitioning between school levels did not appear to be a challenge.

**Table 4. Percentages of FCPS High School Students with Marks of F in 2 or More Classes Overall and By Student Group, SY 2019-20 Q1 Compared to SY 2020-21 Q1**

| | Q1 2019-20 Percent and Count | Q1 2020-21 Percent and Count | Change |
|---|---|---|---|
| High School Students | 8% n=4252 | 12% n=7156 | 50% increase |
| Male Students | 9% n=3036 | 15% n=4592 | 67% increase |
| Female Students | 6% n=1730 | 9% n=2564 | 50% increase |
| Asian Students | 3% n=385 | 5% n=574 | 67% increase |
| Black Students | 10% n=676 | 14% n=864 | 40% increase |
| Hispanic Students | 17% n=2710 | 28% n=4241 | 65% increase |
| White Students | 4% n=832 | 6% n=1223 | 50% increase |
| Students with Disabilities | 12% n=1052 | 20% n=1647 | 67% increase |
| English learner students | 23% n=1787 | 39% n=2614 | 70% increase |
| Economically disadvantaged students | 16% n=2669 | 23% n=3379 | 44% increase |
| 9th grade students | 9% n=1310 | 13% N=1849 | 44% increase |
| 10th grade students | 9% n=1279 | 14% N=2087 | 56% increase |
| 11th grade students | 8% n=1252 | 13% N=1866 | 63% increase |
| 12th grade students | 6% n=859 | 9% n=1353 | 50% increase |

Similar analyses looking at percentages of students with marks of D or F in two or more classes, yielded increases overall and for all student groups, just as was found for marks of F (see Table 5). Of particular note, however, is that looking at both D and F grades shows a pattern of increases among all student groups, just as was found for marks of F, but the amount of increase is far lower. For example, overall among middle and high schools students there was an 83 percent increase in the number of students receiving two or more F marks but a 31 percent increase in the number of students receiving two or more D of F marks. This hints at a finding that much of the increase in students earning two or more F marks was among students who were earning D marks previously.

**Table 5. Percentages of All FCPS Students with Marks of D or F in 2 or More Classes Overall and By Student Group, SY 2019-20 Q1 Compared to SY 2020-21 Q1**

| | Q1 2019-20 Percent and Count | Q1 2020-21 Percent and Count | Change |
|---|---|---|---|
| All Middle and High School Students | 13% n=11416 | 17% n=15271 | 31% increase |
| Middle School Students | 7% n=1820 | 15% n=4391 | 114% increase |
| High School Students | 15% n=9535 | 18% n=10822 | 20% increase |
| Male Students | 16% n=7262 | 21% n=9470 | 31% increase |
| Female Students | 10% n=4093 | 14% n=5743 | 40% increase |
| Asian Students | 5% n=985 | 7% n=1229 | 40% increase |
| Black Students | 18% n=1703 | 20% n=1853 | 11% increase |
| Hispanic Students | 25% n=6010 | 37% n=8752 | 48% increase |
| White Students | 7% n=2244 | 9% n=2798 | 29% increase |
| Students with Disabilities | 21% n=2580 | 29% n=3643 | 38% increase |
| English learner students | 33% n=3828 | 50% n=5389 | 52% increase |
| Economically disadvantaged students | 24% n=6250 | 33% n=7680 | 38% increase |

Disaggregations of D and F marks by school level (middle, high) are available in Appendix A, as are analyses that restricted the look at F marks and D or F marks solely to students who were enrolled in both SY 2019-20 and SY 2020-21. All analyses indicated increases in the percentage of students earning unsatisfactory marks during Q1 of this year with greater increases at the middle school level than high. Although the percentages of students with unsatisfactory marks did increase between Q1 2019-20 and Q1 2020-21, the vast majority of students continue to receive satisfactory marks. Potential decreases in performance among students earning satisfactory marks were considered in Analyses 2, 3, 4, and 5.

## Analysis 2

Given the unique situation the Division finds itself in this year, the second analytic approach looked to see whether this year influenced any changes in course performance in ways different than in past years. The strength of this approach (and Analyses 3 to 5, as well) is that student performance in one year was matched to performance in the subsequent year so that performance over time could studied more accurately. Moreover, these students served as their own 'control' so there were no differences in student demographics between the two years. This approach used regression to determine the extent to which the relation between Q1 marks in SY 2018-19 and SY 2019-20 was the same as the relation between Q1 marks in SY 2019-20 and SY2020-21. The relations were studied looking only at English marks and at mathematics marks, since all students take these courses each year.

For English, the analyses indicated prior performance, course rigor, and school year collectively predicted current course performance ($F$=126.33, $p$<.000) and explained approximately 25 percent of the variation in student marks ($R^2$=.25). Prior performance, which was captured as the previous year's Q1 English mark, had a medium to large

effect[4] on current marks in English (*B*=.49, *p*<.01). Year as a predictor of student marks had little to no effect on student marks (*B*=.03, *p*<.01). In other words, although this school year is unlike any other FCPS has experienced, student marks are related to their prior performance in the same way as in other years. The level of course rigor also had little to no effect on student marks (*B*=.05, *p*<.01).

For mathematics, the findings were similar. Collectively, prior marks, course rigor, and school year predicted current course marks (F=64.10, *p*<.000) and explained approximately 22 percent of the variation in students' Q1 mathematics marks ($R^2$=.22). Again, prior performance had a medium to large effect on current marks in mathematics (*B*=.46, *p*<.01), while year and rigor demonstrated little to no effect on student marks (*B*=.02, *p*<.01 and *B*=.04, *p*<.01, respectively). In other words, although this school year is unlike any other FCPS has experienced, the pattern of performance is very similar to prior years. And as with English, the level of course rigor had little to no effect on student marks in mathematics (*B*=.04, p<.01).

These analyses indicated that students who performed poorly this year were those that performed poorly last year and would likely have performed poorly even without the challenges presented to them this school year. These results expand on what was described above in Approach 1, confirming that the increases in students with Fs mostly reflect students who had performed poorly in the prior year, too. Those that performed well this school year were primarily those that performed well last school year. Additional analyses were conducted to determine the extent to which these relationships that were observed across for all students held when the analyses were conducted with specific student groups. Findings indicated that the same relation existed with all student groups and that prior performance was consistently the best predictor of students' Q1 marks this year (*B* ranged from .37 to .49). Additional details on regression results overall and by student group are presented in Appendix B.

## Analysis 3

The third analytic approach consisted of comparing predicted performance in Q1 of SY 2020-21 with actual performance to identify how off-track student achievement is this year from what would be expected. Table 6 shows that the majority of students performed more highly in Q1 SY 2020-21 than predicted based on the patterns seen in prior years. This held true for both English and mathematics marks. Nonetheless, the data do show that 35 percent of students underperformed in mathematics and that 39 percent underperformed in English during Q1 of SY 2020-21. Looking across student groups, percentages of underperforming students fluctuated with the underperformance most common among English learners (47 percent underperformers in mathematics, 53 percent underperformers in English)

[4] Effect sizes are provided only when there are significant differences (α < 0.05) between the groups. The National Center for Special Education Research (NCSER) suggests that when it comes to interpreting effect sizes, Cohen's (1988) traditional categories of small (0.2), medium (0.5), and large (0.8) are not always appropriate for research on education, particularly education intervention studies. Researchers from the National Survey of Student Engagement (NSSE) at Indiana University Bloomington analyzed effect sizes in the context of empirical data and found that few educational results fit within Cohen's traditional cutoff points. Instead, they proposed alternative cutoffs of 0.1 (small effect), 0.3 (medium effect), and 0.5 (large effect). These suggestions are aligned with findings from NCSER regarding the average effect sizes among education research studies, allowing for a more meaningful interpretation of results. Thus, this report uses these later cut-offs to describe the magnitude of differences or effects.

**Table 6. Percent of Students Under/Overperforming Comparing Predicted to Actual Performance**

| | Mathematics | | English | |
|---|---|---|---|---|
| | **Underperforming (Predicted > Actual)** | **Overperforming (Predicted < Actual)** | **Underperforming (Predicted > Actual)** | **Overperforming (Predicted < Actual)** |
| All Secondary Students | 35<br>n=22815 | 65<br>n=43362 | 39<br>n=24173 | 61<br>n=37513 |
| Male Students | 37<br>n=12885 | 63<br>n=21595 | 41<br>n=13148 | 59<br>n=18784 |
| Female Students | 31<br>n=9930 | 66<br>n=43362 | 37<br>n=10994 | 63<br>n=18728 |
| Asian Students | 29<br>n=4018 | 71<br>n=9955 | 31<br>n=4192 | 69<br>n=9121 |
| Black Students | 33<br>n=2276 | 67<br>n=4568 | 39<br>n=2411 | 61<br>n=3749 |
| Hispanic Students | 42<br>n=7157 | 58<br>n=9796 | 47<br>n=7604 | 53<br>n=8429 |
| White Students | 33<br>n=8105 | 67<br>n=16463 | 38<br>n=8602 | 62<br>n=14055 |
| Student with Disabilities | 42<br>n=3841 | 58<br>n=5383 | 44<br>n=3491 | 56<br>n=4361 |
| English learner students | 47<br>n=3027 | 53<br>n=3375 | 53<br>n=3531 | 47<br>n=3087 |
| Economically disadvantaged students | 32<br>n=15940 | 68<br>n=33197 | 45<br>n=7029 | 55<br>n=8762 |

## Analysis 4

The fourth analysis used regression to determine the extent to which the relation between Q1 marks in SY 2018-19 and SY 2019-20 was the same as the relation between Q1 marks in SY 2019-20 and SY2020-21 for English and mathematics similar to Approach 2. It also controlled for course rigor. However, it introduced a variable to identify whether there were different relations for students whose prior marks were satisfactory (C or higher) or unsatisfactory (C- or below). Then comparisons were made between actual performance in SY 2020-21 and predicted performance similar to Approach 3 using the revised prediction that takes into account any different relations for satisfactory or unsatisfactory performance.

For English, the analyses indicated prior performance, course rigor, and school year collectively predicted current course performance ($F$=8198, $p$<.000) and explained approximately 22 percent of the variation in students' English marks ($R^2$=.24). Prior performance, as measured by the previous year's Q1 English marks had a medium to large effect on current marks in English ($B$=.51, $p$<.01). Year as a predictor of student marks had little to no effect on student marks ($B$=.03, p<.01) nor did course rigor ($B$=.05, p<.01). Moreover, whether the student's marks were previously satisfactory or unsatisfactory had little to no effect on marks in English (B=-.03, p<.01).

For mathematics, the findings were similar. Collectively, prior marks, course rigor, school year, and satisfactory marks predicted current course marks (F=62.096, p<.000) and explained approximately 24 percent of the variation in students mathematics marks ($R^2$=.24). Prior performance, as measured by the previous year's Q1 mathematics marks had a medium to large effect on current marks in mathematics ($B$=.48, $p$<.01). Year as a predictor of student marks had little to no effect on student marks ($B$=.02, $p$<.01) nor did course rigor ($B$=.04, $p$<.01). Moreover, whether the student's marks were previously satisfactory or unsatisfactory had little to no effect on marks in mathematics ($B$=-.03, $p$<.01). In other words, although this school year is unlike any other FCPS has experienced, student performance across the range of marks was consistent with prior years in both English and mathematics.

This can be observed in the comparison of actual marks to predicted marks in Tables 7 and 8. Of the students who earned a mark of A in Quarter 1 in English, approximately half were predicted to get an A and half were predicted

to get a B based on prior performance and course rigor. For students who earned a mark of B in English, approximately 59 percent were predicted to earn a B, 28 percent predicted to earn an A, and the remainder predicted to earn a mark below B. However, as earned marks go lower, the match between earned mark and predicted mark are lessened.

**Table 7. Percent Predicted Letter Grade in Mathematics for SY 2020-21 Compared to Actual Letter Grade in SY 2020-21**

| | | Actual Performance SY2021 | | | | |
|---|---|---|---|---|---|---|
| | | **A** | **B** | **C** | **D** | **F** |
| **Predicted Performance SY2021** | A | 48% n=12015 | 28% n=5084 | 14% n=1246 | 7% n=244 | 4% n=226 |
| | B | 47% n=11748 | 59% n=10953 | 59% n=5319 | 50% n=1660 | 40% n=2217 |
| | C | 5% n=1305 | 12% n=2164 | 23% n=2082 | 36% n=1205 | 41% n=2283 |
| | D | 0.4% n=100 | 1% n=234 | 4% n=329 | 6% n=193 | 14% n=798 |
| | F | 0.01% n=3 | 0.1% n=15 | 0.2% n=18 | 0.2% n=8 | 1% n=51 |

**Table 8. Percent Predicted Letter Grade in English for SY 2020-21 Compared to Actual Letter Grade in SY 2020-21**

| | | Actual Performance SY2021 | | | | |
|---|---|---|---|---|---|---|
| | | **A** | **B** | **C** | **D** | **F** |
| **Predicted Performance SY2021** | A | 59% n=20001 | 32% n=5381 | 17% n=1206 | 10% n=260 | 6% n=289 |
| | B | 38% n=13002 | 57% n=9500 | 62% n=4464 | 57% n=1515 | 45% n=2319 |
| | C | 3% n=1077 | 10% n=1582 | 19% n=1384 | 28% n=746 | 41% n=2079 |
| | D | 0.2% n=78 | 1% n=109 | 2% n=159 | 5% n=128 | 8% n=410 |
| | F | 0% n=0 | 0% n=0 | 0% n=0 | 0% n=0 | 0% n=0 |

## Analysis 5

The final analytic approach worked to determine the extent to which the probability of passing a course was the same in Q1 of SY 2020-21, when students were primarily learning online, as it had been in Q1 of SY 2019-20 when students were learning in-person. This analysis again focused solely on English and mathematics marks. Like Analysis 4, this analysis looked at the extent to which prior performance and course rigor affected the probability of receiving a passing mark.

Consistent with the findings from Analysis 1, the effect of school year was negative, indicating that the probability of passing a course decreased in SY 2020-21 as compared to other years. the effect of school year was also negative indicating that the probability of passing a course was decreased in SY 2020-21. The analyses showed that there was a 40 percent decrease in the likelihood of passing mark in English in Q1 2020-21 compared to Q1 2019-20 and a 30 percent decrease in the likelihood of a passing mark in mathematics in Q1 2020-21 compared to Q1 2019-20. So while increased rigor and SY 2020-21 decreased the likelihood of a passing mark, previous performance increased the likelihood of a passing mark. Therefore, students with previous high performance were likely to continue to perform at high levels even with the added challenges experienced in Quarter 1 of SY 2020-21. As in the other analyses that included a student's prior performance, Analysis 5 analyses showed that prior

performance continued to have a large and positive effect on the probability of receiving a passing for Q1 of SY 2020-21. For example, having a B last year at Q1 meant a student was two and half times as likely to receive a Q1 passing mark this year as a student who had a C for prior performance in English. Course rigor has a negative effect on passing, large for English and small for mathematics, indicating that rigorous courses decreased the probability of passing. The analyses showed that for each increment up in rigor (from standard to honors; from Honors to AP/IB) there was a 50 percent decrease in the likelihood of a passing mark in English and 20 percent decrease in the likelihood of receiving a passing mark for mathematics compared to the lower level of rigor. So while increased rigor decreased the likelihood of a passing mark in both years, and previous performance increased the likelihood of a passing mark in both years, students were more likely to fail this year than they had in prior years. Students with previous high performance were likely to continue to perform at high levels even with the added challenges experienced in Quarter 1 of SY 2020-21.

**Table 8: Logistic Regression**

| Content Area | Variable | Effect | Exp(B) |
|---|---|---|---|
| English | Prior Performance | Large, Positive | 2.5 |
| | Course Rigor | Large, Negative | .5 |
| | Year | Large, Negative | .6 |
| Mathematics | Prior Performance | Large, Positive | 2.3 |
| | Course Rigor | Small, Negative | .8 |
| | Year | Medium, Negative | .7 |

Tables 9 and 10 display the percent of students who passed or performed at satisfactory levels as compared to prior performance. As Table 9 shows, the large majority of students who earned passing marks in Math and English in SY 2020-21 were students who earned passing marks last year. Of the students that earned a failing mark, a large percentage of those students had not previously earned a failing mark in that content area.

**Table 9. Pass/Fail Rate in SY2019 Compared to SY2021**

| | **Math** | | **English** | |
|---|---|---|---|---|
| | **Pass SY2021** | **Fail SY2021** | **Pass SY2021** | **Fail SY2021** |
| Pass SY1920 | 96<br>n=54084 | 79<br>n=4419 | 98<br>n=59532 | 81<br>n=4168 |
| Fail SY1920 | 4<br>n=1996 | 21<br>n=1207 | 2<br>n=1492 | 19<br>n=985 |

Table 10 groups student performance based on earning a mark of C or higher. The large majority of students who earned marks of C or higher had previously performed at those levels. However, the majority of students who earned marks below a C had not previously performed at those levels.

**Table 10. Satisfactory/Unsatisfactory Mark Rate in SY2019 Compared to SY2021**

| | **Math** | | **English** | |
|---|---|---|---|---|
| | **Satisfactory Performance (Mark = A,B,C,C+) SY2021** | **Unsatisfactory Performance (Mark = C-,D,F) SY2021** | **Satisfactory Performance (Mark = A,B,C,C+) SY2021** | **Unsatisfactory Performance (Mark = C-,D,F) SY2021** |
| Satisfactory Performance (Mark = A,B,C,C+) SY 1920 | 90<br>n=45582 | 62<br>n=7008 | 93<br>n=52720 | 65<br>n=6278 |
| Unsatisfactory Performance (Mark = C-,D,F) SY1920 | 10<br>n=4805 | 38<br>n=4311 | 7<br>n=3797 | 35<br>n=3382 |

Additional details on regression results are presented in Appendix B.

# Summary

Based on the findings of the analyses presented here, there is reason for concern about the performance of some middle and high school students based on their Q1 marks from this school year. Results indicate a widening gap between students who were previously performing satisfactorily and those performing unsatisfactorily. In other words, students who performed well previously primarily performed slightly better than expected during Q1 of this year. In contrast, students who were previously not performing well, performed considerably less well. A greater proportion of low-performing students received failing grades during Q1 than would have been expected based on patterns of marks in prior years.

Students at the middle school level had a notable increase in the percentage of failures, while at the high school level the increase also existed but was considerably smaller. The pattern was pervasive across all student groups, grade levels, and content areas examined in this report. The trend of more failing marks is concerning across the board but is especially concerning for the groups that showed the biggest unpredicted increases in receiving multiple unsatisfactory marks, namely our English learner students and students with disabilities.

The majority of students at the middle and high school level received strong grades in Q1 of this year, continuing to perform at levels comparable to prior years in English and mathematics. Analyses did not yield an overall drop in marks for Q1 of this year among all students or even the majority of students. In fact, the majority of students outperformed expected marks based on prior patterns.

Given that FCPS is growing and seeking to improve teaching and learning for all students, schools should continue to monitor student performance for our English learners and students with disabilities in particular and provide intervention supports as needed. ORSI's study of teaching and learning efforts will continue to analyze student outcomes in its next report due in February 2021.

# Appendix A

**Table A-1. Percentages of FCPS Middle School Students with Marks of D or F in 2 or More Classes Overall and By Student Group, SY 2019-20 Q1 Compared to SY 2020-21 Q1**

| | Q1 2019-20 Percent and Count | Q1 2020-21 Percent and Count | Change |
|---|---|---|---|
| Middle School Students | 7% n=1820 | 15% n=4391 | 114% increase |
| Male Students | 9% n=1218 | 18% n=2683 | 100% increase |
| Female Students | 5% n=602 | 12% n=1708 | 140% increase |
| Asian Students | 2% n=107 | 5% n=301 | 150% increase |
| Black Students | 11% n=287 | 17% n=519 | 55% increase |
| Hispanic Students | 15% n=1143 | 33% n=2832 | 120% increase |
| White Students | 3% n=243 | 6% n=585 | 100% increase |
| Students with Disabilities | 12% n=453 | 27% n=1158 | 125% increase |
| English learner students | 21% n=789 | 46% n=1864 | 119% increase |
| Economically disadvantaged students | 15% n=1309 | 32% n=2794 | 113% increase |

**Table A-2. Percentages of FCPS High School Students with Marks of D or F in 2 or More Classes Overall and By Student Group, SY 2019-20 Q1 Compared to SY 2020-21 Q1**

| | Q1 2019-20 Percent and Count | Q1 2020-21 Percent and Count | Change |
|---|---|---|---|
| High School Students | 15% n=9535 | 18% n=10822 | 20% increase |
| Male Students | 18% n=6004 | 22% n=6787 | 22% increase |
| Female Students | 12% n=3491 | 14% n=4035 | 17% increase |
| Asian Students | 7% n=878 | 8% n=928 | 14% increase |
| Black Students | 22% n=1416 | 22% n=1334 | 0% increase |
| Hispanic Students | 30% n=4867 | 39% n=5920 | 30% increase |
| White Students | 8% n=2001 | 10% n=2213 | 25% increase |
| Students with Disabilities | 24% n=2127 | 30% n=2485 | 25% increase |
| English learner students | 38% n=3039 | 52% n=3525 | 37% increase |
| Economically disadvantaged students | 29% n=4941 | 34% n=4886 | 17% increase |

The next set of analyses compared the performance for students who were enrolled in FCPS in both school years to make comparisons across two similar populations of students. Similar observations were made for this population of students as the first set of analyses. The results showed that the percentage of students with 2 or more unsatisfactory marks at the end of Q1 increased in SY 2020-21 for all student groups when compared to Q1 SY 2019-20. The amount of increase in two or more Fs was significantly greater for middle school students (350 percent) than for high school students (100 percent). The amount of increase for Asian, Hispanic, Students with Disabilities, English learner, and Economically Disadvantaged students was 100 percent or greater.

A similar pattern was observed for the percent of students with marks of D or F in 2 or more classes however the amount of increase was less. The amount of increase in two or more D/Fs remained significantly higher for middle school students (167 percent) than for high school students (39 percent). The amount of increase was greater than 50 percent for Hispanic, White, English learner, and Economically Disadvantaged students.

**Table A-3.**
**Percent of Students with Marks of F in 2 or more classes - Matched Population**

| | Q1 2019-20<br>Percent and Count | Q1 2020-21<br>Percent and Count | Change |
|---|---|---|---|
| All Secondary Students | 5%<br>n=3769 | 11%<br>n=8005 | 120% increase |
| Middle School Students | 2%<br>n=252 | 9%<br>n=1327 | 350% increase |
| High School Students | 6%<br>n=3497 | 12%<br>n=6633 | 100% increase |
| Male Students | 7%<br>n=2385 | 14%<br>n=5133 | 100% increase |
| Female Students | 4%<br>n=1364 | 8%<br>n=2827 | 100% increase |
| Asian Students | 2%<br>n=283 | 4%<br>n=587 | 100% increase |
| Black Students | 8%<br>n=556 | 13%<br>n=940 | 63% increase |
| Hispanic Students | 11%<br>n=2145 | 26%<br>n=4878 | 136% increase |
| White Students | 3%<br>n=635 | 5%<br>n=1278 | 67% increase |
| Students with Disabilities | 9%<br>n=954 | 19%<br>n=1943 | 111% increase |
| English learner students | 16%<br>n=1280 | 37%<br>n=2990 | 131% increase |
| Economically disadvantaged students | 11%<br>n=1950 | 22%<br>n=4112 | 100% increase |

**Table A-4.**
**Percent of Students with Marks of D or F in 2 or more classes – Matched Population**

| | Q1 2019-20 Percent and Count | Q1 2020-21 Percent and Count | Change |
|---|---|---|---|
| All Secondary Students | 12% n=8417 | 18% n=12419 | 50% increase |
| Middle School Students | 6% n=907 | 16% n=2298 | 167% increase |
| High School Students | 13% n=7475 | 18% n=10075 | 39% increase |
| Male Students | 15% n=5300 | 21% n=7761 | 40% increase |
| Female Students | 9% n=3082 | 14% n=4612 | 56% increase |
| Asian Students | 5% n=794 | 7% n=1003 | 40% increase |
| Black Students | 18% n=1278 | 24% n=1479 | 33% increase |
| Hispanic Students | 24% n=4474 | 38% n=7062 | 58% increase |
| White Students | 6% n=1616 | 9% n=2351 | 50% increase |
| Students with Disabilities | 21% n=2108 | 30% n=3014 | 43% increase |
| English learner students | 32% n=2580 | 52% n=4171 | 63% increase |
| Economically disadvantaged students | 22% n=4129 | 33% n=6133 | 50% increase |

# Appendix B

## English Marks

*Linear Quality Points (Scale 0.0-4.0) as Dependent Variable*

**SY 2020-21 English Q1 Quality Points – All students**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | B | *SE* | *B* | B | *SE* | *B* | B | *SE* | *B* |
| TIME 1 English Q1 Quality Points | 0.56 | 0.00 | 0.49** | 0.56 | 0.00 | 0.49** | 0.56 | 0.00 | 0.49** |
| TIME 1 English Rigor | 0.04 | 0.01 | 0.02** | 0.12 | 0.01 | 0.05** | 0.12 | 0.01 | 0.05** |
| TIME 2 English Rigor | | | | -0.15 | 0.01 | -0.06** | -0.15 | 0.01 | -0.06** |
| Year | | | | | | | 0.06 | 0.01 | 0.03 |
| $R^2$ | 0.23 | | | 0.24 | | | 0.25 | | |
| F for $R^2$ change | 20,162.13** | | | 336.06** | | | 126.33** | | |

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

**SY 2020-21 English Q1 Quality Points – White students**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | B | *SE* | *B* | B | *SE* | *B* | B | *SE* | *B* |
| TIME 1English Q1 Quality Points | 0.50 | 0.01 | 0.44** | 0.49 | 0.01 | 0.44** | 0.49 | 0.01 | 0.44** |
| TIME 1English Rigor | 0.03 | 0.01 | 0.01** | 0.12 | 0.01 | 0.06** | 0.12 | 0.01 | 0.06** |
| TIME 2 English Rigor | | | | -0.18 | 0.01 | -0.08** | -0.18 | 0.01 | -0.08** |
| Year | | | | | | | 0.09 | 0.01 | 0.05** |
| $R^2$ | 0.20 | | | 0.20 | | | 0.20 | | |
| F for $R^2$ change | 6,047.63** | | | 224.72** | | | 146.43** | | |

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

**SY 2020-21 English Q1 Quality Points – Black students**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | B | *SE* | *B* | B | *SE* | *B* | B | *SE* | *B* |
| TIME 1English Q1 Quality Points | 0.49 | 0.01 | 0.43** | 0.49 | 0.01 | 0.43** | 0.49 | 0.01 | 0.43** |
| TIME 1English Rigor | 0.02 | 0.01 | 0.01 | 0.16 | 0.02 | 0.07** | 0.16 | 0.02 | 0.07** |
| TIME 2 English Rigor | | | | -0.26 | 0.03 | -0.09** | -0.26 | 0.03 | -0.09** |
| Year | | | | | | | 0.15 | 0.03 | 0.06** |
| $R^2$ | 0.19 | | | 0.19 | | | 0.20 | | |
| F for $R^2$ change | 1,550.85** | | | 86.33** | | | 68.71** | | |

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

**SY 2020-21 English Q1 Quality Points – Hispanic students**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | B | *SE* | *B* | B | *SE* | *B* | B | *SE* | *B* |
| TIME 1 English Q1 Quality Points | 0.51 | 0.01 | 0.43** | 0.51 | 0.01 | 0.43** | 0.51 | 0.01 | 0.43** |
| TIME 1 English Rigor | 0.02 | 0.01 | 0.01 | 0.12 | 0.02 | 0.04** | 0.12 | 0.02 | 0.04** |
| TIME 2 English Rigor | | | | -0.17 | 0.02 | -0.05** | -0.17 | 0.02 | -0.05** |
| Year | | | | | | | -0.04 | 0.01 | -0.01** |
| $R^2$ | 0.19 | | | 0.19 | | | 0.19 | | |
| F for $R^2$ change | 3,745.03** | | | 66.49** | | | 7.88** | | |

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

**SY 2020-21 English Q1 Quality Points – Asian students**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | B | *SE* | *B* | B | *SE* | *B* | B | *SE* | *B* |
| TIME 1 English Q1 Quality Points | 0.48 | 0.01 | 0.43** | 0.48 | 0.01 | 0.43** | 0.48 | 0.01 | 0.43** |
| TIME 1 English Rigor | -0.02 | 0.01 | -0.01** | 0.04 | 0.01 | 0.02** | 0.04 | 0.01 | 0.02** |
| TIME 2 English Rigor | | | | -0.13 | 0.02 | -0.06** | -0.13 | 0.02 | -0.06** |
| Year | | | | | | | 0.10 | 0.01 | 0.06** |
| $R^2$ | 0.19 | | | 0.19 | | | 0.20 | | |
| F for $R^2$ change | 3,286.59** | | | 77.61** | | | 7.88** | | |

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

**SY 2020-21 English Q1 Quality Points – Other Race students**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | B | *SE* | *B* | B | *SE* | *B* | B | *SE* | *B* |
| TIME 1 English Q1 Quality Points | 0.52 | 0.01 | 0.46** | 0.52 | 0.01 | 0.45** | 0.52 | 0.01 | 0.45** |
| TIME 1 English Rigor | 0.01 | 0.02 | 0.01** | 0.10 | 0.02 | 0.05** | 0.09 | 0.03 | 0.05** |
| TIME 2 English Rigor | | | | -0.16 | 0.03 | -0.07** | -0.16 | 0.03 | -0.07** |
| Year | | | | | | | 0.08 | 0.02 | 0.04** |
| $R^2$ | 0.21 | | | 0.21 | | | 0.21 | | |
| F for $R^2$ change | 972.47** | | | 25.96** | | | 14.07** | | |

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

**SY 2020-21 English Q1 Quality Points – Economically Disadvantaged students**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | B | *SE* | *B* | B | *SE* | *B* | B | *SE* | *B* |
| TIME 1 English Q1 Quality Points | 0.51 | 0.01 | 0.43** | 0.50 | 0.01 | 0.43** | 0.50 | 0.01 | 0.43** |
| TIME 1 English Rigor | 0.06 | 0.01 | 0.02** | 0.17 | 0.02 | 0.07** | 0.17 | 0.02 | 0.07** |
| TIME 2 English Rigor | | | | -0.21 | 0.02 | -0.07** | -0.21 | 0.02 | -0.07** |
| Year | | | | | | | 0.01 | 0.01 | 0.00 |
| $R^2$ | 0.19 | | | 0.19 | | | 0.19 | | |
| F for $R^2$ change | 3,946.48** | | | 116.32** | | | 0.23 | | |

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

**SY 2020-21 English Q1 Quality Points – English Learner students**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | B | *SE* | *B* | B | *SE* | *B* | B | *SE* | *B* |
| TIME 1 English Q1 Quality Points | 0.44 | 0.01 | 0.37 | 0.44 | 0.01 | 0.37** | 0.44 | 0.01 | 0.37** |
| TIME 1 English Rigor | -0.09 | 0.02 | -0.03 | -0.00 | 0.03 | -0.00 | -0.00 | 0.03 | -0.00 |
| TIME 2 English Rigor | | | | -0.14 | 0.04 | -0.04** | -0.14 | 0.04 | -0.05** |
| Year | | | | | | | -0.07 | 0.02 | -0.03** |
| $R^2$ | 0.14 | | | 0.14 | | | 0.14 | | |
| F for $R^2$ change | 998.13** | | | 14.06** | | | 9.69** | | |

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

**SY 2020-21 English Q1 Quality Points – Students with Disabilities**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | B | *SE* | *B* | B | *SE* | *B* | B | *SE* | *B* |
| TIME 1 English Q1 Quality Points | 0.49 | 0.01 | 0.43** | 0.49 | 0.01 | 0.43** | 0.49 | 0.01 | 0.43** |
| TIME 1 English Rigor | 0.04 | 0.02 | 0.02* | 0.09 | 0.02 | 0.04** | 0.09 | 0.02 | 0.04** |
| TIME 2 English Rigor | | | | -0.10 | 0.03 | -0.03** | -0.10 | 0.03 | -0.03** |
| Year | | | | | | | -0.01 | 0.02 | -0.00 |
| $R^2$ | 0.18 | | | 0.19 | | | 0.19 | | |
| F for $R^2$ change | 2,009.50** | | | 14.29** | | | 0.41 | | |

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

## *Dichotomous Mark (Scale: Pass/Fail) as Dependent Variable*

**SY 2020-21 English Q1 Pass/Fail – All students**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | B | *SE* | df | B | *SE* | df | B | *SE* | df |
| TIME 1 English Q1 Quality Points | 0.93** | 0.01 | 1 | 0.93** | 0.01 | 1 | 0.93** | 0.01 | 1 |
| TIME 1 English Rigor | 0.05** | 0.03 | 1 | 0.36** | 0.03 | 1 | 0.37** | 0.03 | 1 |
| TIME 2 English Rigor | | | | -0.68** | 0.04 | 1 | -0.69** | 0.04 | 1 |
| Year | | | | | | | -0.59** | 0.03 | 1 |
| Model $\chi^2$ | 9,343.69** | | | 9,614.26** | | | 10,180.11** | | |
| Model df | 2 | | | 3 | | | 4 | | |

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

**SY 2020-21 English Q1 Pass/Fail – White students**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | B | *SE* | df | B | *SE* | df | B | *SE* | df |
| TIME 1 English Q1 Quality Points | 1.00** | 0.22 | 1 | 1.00** | 0.02 | 1 | 1.01** | 0.02 | 1 |
| TIME 1 English Rigor | -0.05 | 0.06 | 1 | 0.34** | 0.07 | 1 | 0.36** | 0.07 | 1 |
| TIME 2 English Rigor | | | | -0.99** | 0.11 | 1 | -1.00** | 0.10 | 1 |
| Year | | | | | | | -0.55** | 0.06 | 1 |
| Model $\chi^2$ | 2,031.22** | | | 2,127.67** | | | 2.230.13** | | |
| Model df | 2 | | | 3 | | | 4 | | |

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

**SY 2020-21 English Q1 Pass/Fail – Black students**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | B | *SE* | df | B | *SE* | df | B | *SE* | df |
| TIME 1 English Q1 Quality Points | 0.81** | 0.03 | 1 | 0.81** | 0.03 | 1 | 0.82** | 0.03 | 1 |
| TIME 1 English Rigor | 0.07 | 0.07 | 1 | 0.52** | 0.08 | 1 | 0.53** | 0.08 | 1 |
| TIME 2 English Rigor | | | | -1.01** | 0.12 | 1 | -1.03** | 0.12 | 1 |
| Year | | | | | | | 0.46** | 0.07 | 1 |
| Model $\chi^2$ | 867.42** | | | 948.90** | | | 994.09** | | |
| Model df | 2 | | | 3 | | | 4 | | |

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

**SY 2020-21 English Q1 Pass/Fail – Hispanic students**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | B | *SE* | df | B | *SE* | df | B | *SE* | df |
| TIME 1 English Q1 Quality Points | 0.69** | 0.01 | 1 | 0.68** | 0.01 | 1 | 0.69 | 0.01 | 1 |
| TIME 1 English Rigor | -0.10** | 0.04 | 1 | 0.20** | 0.04 | 1 | 0.20 | 0.04 | 1 |
| TIME 2 English Rigor | | | | -0.59** | 0.06 | 1 | -0.60 | 0.06 | 1 |
| Year | | | | | | | -0.62 | 0.04 | 1 |
| Model $\chi^2$ | 2,699.27** | | | 2,810.55** | | | 3,131.28** | | |
| Model df | 2 | | | 3 | | | 4 | | |

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

**SY 2020-21 English Q1 Pass/Fail – Asian students**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | B | *SE* | Df | B | *SE* | df | B | *SE* | df |
| TIME 1 English Q1 Quality Points | 1.05** | 0.03 | 1 | 1.05** | 0.03 | 1 | 1.06** | 0.03 | 1 |
| TIME 1 English Rigor | 0.05 | 0.09 | 1 | 0.45** | 0.10 | 1 | 0.46** | 0.10 | 1 |
| TIME 2 English Rigor | | | | -0.96** | 0.15 | 1 | -0.98** | 0.15 | 1 |
| Year | | | | | | | -0.55** | 0.08 | 1 |
| Model $\chi^2$ | 947.79** | | | 992.07** | | | 1,036.85** | | |
| Model df | 2 | | | 3 | | | 4 | | |

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

**SY 2020-21 English Q1 Pass/Fail – Other Race students**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | B | *SE* | Df | B | *SE* | df | B | *SE* | df |
| TIME 1 English Q1 Quality Points | 0.97** | 0.05 | 1 | 0.98** | 0.05 | 1 | 0.98** | 0.05 | 1 |
| TIME 1 English Rigor | -0.00 | 0.13 | 1 | 0.31* | 0.16 | 1 | 0.32* | 0.16 | 1 |
| TIME 2 English Rigor | | | | -0.72** | 0.22 | 1 | -0.73** | 0.22 | 1 |
| Year | | | | | | | -0.61** | 0.13 | 1 |
| Model $\chi^2$ | 358.11** | | | 369.19** | | | 392.09 | | |
| Model df | 2 | | | 3 | | | 4 | | |

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

**SY 2020-21 English Q1 Pass/Fail – Economically Disadvantaged students**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | B | *SE* | df | B | *SE* | df | B | *SE* | df |
| TIME 1 English Q1 Quality Points | 0.69** | 0.01 | 1 | 0.69** | 0.01 | 1 | 0.70** | 0.01 | 1 |
| TIME 1 English Rigor | -0.01 | 0.04 | 1 | 0.33** | 0.04 | 1 | 0.33** | 0.04 | 1 |
| TIME 2 English Rigor | | | | -0.68** | 0.05 | 1 | -0.69** | 0.05 | 1 |
| Year | | | | | | | -0.56** | 0.04 | 1 |
| Model $\chi^2$ | 2,635.21** | | | 2,796.41** | | | 3,060.47** | | |
| Model df | 2 | | | 3 | | | 4 | | |

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

**SY 2020-21 English Q1 Pass/Fail – English Learner students**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | B | *SE* | df | B | *SE* | df | B | *SE* | df |
| TIME 1 English Q1 Quality Points | 0.56** | 0.02 | 1 | 0.56** | 0.02** | 1 | 0.56** | 0.02 | 1 |
| TIME 1 English Rigor | -0.21** | 0.05 | 1 | 0.10 | 0.07 | 1 | 0.10 | 0.07 | 1 |
| TIME 2 English Rigor | | | | -0.55 | 0.08** | 1 | -0.58** | 0.08 | 1 |
| Year | | | | | | | -0.58** | 0.05 | 1 |
| Model $\chi^2$ | 874.50** | | | 919.43** | | | 1,058.29** | | |
| Model df | 2 | | | 3 | | | 4 | | |

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

**SY 2020-21 English Q1 Pass/Fail – Students with Disabilities**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | B | *SE* | df | B | *SE* | df | B | *SE* | df |
| TIME 1 English Q1 Quality Points | 0.74** | 0.02 | 1 | 0.74** | 0.02 | 1 | 0.74** | 0.02 | 1 |
| TIME 1 English Rigor | -0.08 | 0.05 | 1 | 0.20** | 0.07 | 1 | 0.20** | 0.07 | 1 |
| TIME 2 English Rigor | | | | -0.57** | 0.98 | 1 | -0.60** | 0.09 | 1 |
| Year | | | | | | | -0.65** | 0.05 | 1 |
| Model $\chi^2$ | 1,248.61** | | | 1,291.54 | | | 1,446.73 | | |
| Model df | 2 | | | 3 | | | 4 | | |

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

## Math Marks

*Linear Quality Points (Scale 0.0-4.0) as Dependent Variable*

**SY 2020-21 Mathematics Q1 Quality Points – All students**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | B | *SE* | *B* | B | *SE* | *B* | B | *SE* | *B* |
| TIME 1 Mathematics Q1 Quality Points | 0.51 | 0.00 | 0.46** | 0.51 | 0.00 | 0.46** | 0.51 | 0.00 | 0.46** |
| TIME 1 Mathematics Rigor | 0.11 | 0.01 | 0.04** | 0.10 | 0.01 | 0.04** | 0.10 | 0.01 | 0.04** |
| TIME 2 Mathematics Rigor | | | | 0.01 | 0.01 | 0.00 | 0.01 | 0.01 | 0.00 |
| Year | | | | | | | 0.05 | 0.01 | 0.02** |
| $R^2$ | 0.22 | | | 0.22 | | | 0.22 | | |
| F for $R^2$ change | 17,301.24** | | | 1.00 | | | 64.10** | | |

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

**SY 2020-21 Mathematics Q1 Quality Points – White students**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | B | *SE* | *B* | B | *SE* | *B* | B | *SE* | *B* |
| TIME 1 Mathematics Q1 Quality Points | 0.43 | 0.01 | 0.40** | 0.44 | 0.01 | 0.40** | 0.44 | 0.01 | 0.40** |
| TIME 1 Mathematics Rigor | 0.08 | 0.01 | 0.03** | 0.09 | 0.01 | 0.04** | 0.10 | 0.01 | 0.04** |
| TIME 2 Mathematics Rigor | | | | -0.06 | 0.02 | -0.02** | -0.06 | 0.02 | -0.02** |
| Year | | | | | | | 0.09 | 0.01 | 0.05** |
| $R^2$ | 0.16 | | | 0.16 | | | 0.16 | | |
| F for $R^2$ change | 3,045.35** | | | 7.67** | | | 76.37** | | |

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

**SY 2020-21 Mathematics Q1 Quality Points – Black students**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | B | *SE* | *B* | B | *SE* | *B* | B | *SE* | *B* |
| TIME 1 Mathematics Q1 Quality Points | 0.49 | 0.01 | 0.46** | 0.49 | 0.01 | 0.46** | 0.49 | 0.01 | 0.46** |
| TIME 1 Mathematics Rigor | 0.05 | 0.02 | 0.02** | 0.07 | 0.02 | 0.03** | 0.07 | 0.02 | 0.03** |
| TIME 2 Mathematics Rigor | | | | -0.06 | 0.03 | -0.02* | -0.06 | 0.03 | -0.02 |
| Year | | | | | | | 0.07 | 0.02 | 0.03** |
| $R^2$ | 0.21 | | | 0.21 | | | 0.21 | | |
| F for $R^2$ change | 1,834.31** | | | 3.49 | | | 14.51** | | |

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

**SY 2020-21 Mathematics Q1 Quality Points – Hispanic students**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | B | *SE* | *B* | B | *SE* | *B* | B | *SE* | *B* |
| TIME 1 Mathematics Q1 Quality Points | 0.52 | 0.01 | 0.46** | 0.52 | 0.01 | 0.46** | 0.52 | 0.01 | 0.46** |
| TIME 1 Mathematics Rigor | 0.07 | 0.01 | 0.03** | 0.05 | 0.02 | 0.02** | 0.05 | 0.02 | 0.02** |
| TIME 2 Mathematics Rigor | | | | 0.05 | 0.02 | 0.01** | 0.05 | 0.02 | 0.01** |
| Year | | | | | | | -0.05 | 0.01 | -0.02** |
| $R^2$ | 0.21 | | | 0.21 | | | 0.21 | | |
| F for $R^2$ change | 5,344.55** | | | 6.40** | | | 17.75** | | |

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

**SY 2020-21 Mathematics Q1 Quality Points – Asian students**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | B | *SE* | *B* | B | *SE* | *B* | B | *SE* | *B* |
| TIME 1 Mathematics Q1 Quality Points | 0.44 | 0.01 | 0.41** | 0.44 | 0.01 | 0.41** | 0.44 | 0.01 | 0.41** |
| TIME 1 Mathematics Rigor | 0.02 | 0.01 | 0.01 | 0.03 | 0.01 | 0.01* | 0.02 | 0.01 | 0.01* |
| TIME 2 Mathematics Rigor | | | | -0.06 | 0.02 | -0.02** | -0.06 | 0.02 | -0.02** |
| Year | | | | | | | 0.14 | 0.01 | 0.07** |
| $R^2$ | 0.16 | | | 0.16 | | | 0.17 | | |
| F for $R^2$ change | 3,028.05** | | | 8.04** | | | 185.00** | | |

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

**SY 2020-21 Mathematics Q1 Quality Points – Other Race students**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | B | *SE* | *B* | B | *SE* | *B* | B | *SE* | *B* |
| TIME 1 Mathematics Q1 Quality Points | 0.43 | 0.01 | 0.39** | 0.42 | 0.01 | 0.39** | 0.43 | 0.01 | 0.39** |
| TIME 1 Mathematics Rigor | 0.13 | 0.03 | 0.05** | 0.13 | 0.03 | 0.05** | 0.13 | 0.03 | 0.05** |
| TIME 2 Mathematics Rigor | | | | -0.04 | 0.05 | -0.01 | -0.04 | 0.05 | -0.01 |
| Year | | | | | | | 0.02 | 0.02 | 0.01 |
| $R^2$ | 0.15 | | | 015 | | | 0.15 | | |
| F for $R^2$ change | 714.22** | | | 0.52 | | | 0.84 | | |

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

**SY 2020-21 Mathematics Q1 Quality Points – Economically Disadvantaged students**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | B | *SE* | *B* | B | *SE* | *B* | B | *SE* | *B* |
| TIME 1 Mathematics Q1 Quality Points | 0.51 | 0.01 | 0.46** | 0.51 | 0.01 | 0.46** | 0.51 | 0.01 | 0.46** |
| TIME 1 Mathematics Rigor | 0.93 | 0.01 | 0.04** | 0.81 | 0.01 | 0.03** | 0.08 | 0.01 | 0.03** |
| TIME 2 Mathematics Rigor | | | | 0.03 | 0.02 | 0.01 | 0.03 | 0.02 | 0.01 |
| Year | | | | | | | 0.02 | 0.01 | 0.01 |
| $R^2$ | 0.21 | | | 0.21 | | | 0.21 | | |
| F for $R^2$ change | 6,089.36** | | | 2.59 | | | 3.09 | | |

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

**SY 2020-21 Mathematics Q1 Quality Points – English Learner students**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | B | *SE* | *B* | B | *SE* | *B* | B | *SE* | *B* |
| TIME 1 Mathematics Q1 Quality Points | 0.54 | 0.01 | 0.48** | 0.53 | 0.01 | 0.47** | 0.53 | 0.01 | 0.47** |
| TIME 1 Mathematics Rigor | -0.06 | 0.02 | -0.02 | -0.14 | 0.02 | -0.05** | -0.14 | 0.02 | -0.05** |
| TIME 2 Mathematics Rigor | | | | 0.16 | 0.03 | 0.05** | -0.16 | 0.03 | 0.05** |
| Year | | | | | | | -0.07 | 0.03 | -0.03** |
| $R^2$ | 0.23 | | | 0.23 | | | 0.23 | | |
| F for $R^2$ change | 2,704.13** | | | 33.61** | | | 16.80** | | |

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

**SY 2020-21 Mathematics Q1 Quality Points – Students with Disabilities**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | B | *SE* | *B* | B | *SE* | *B* | B | *SE* | *B* |
| TIME 1 Mathematics Q1 Quality Points | 0.50 | 0.01 | 0.46** | 0.50 | 0.01 | 0.46** | 0.50 | 0.01 | 0.46** |
| TIME 1 Mathematics Rigor | 0.13 | 0.02 | 0.05** | 0.11 | 0.02 | 0.05** | 0.12 | 0.02 | 0.05** |
| TIME 2 Mathematics Rigor | | | | 0.03 | 0.02 | 0.01 | 0.03 | 0.02 | 0.01 |
| Year | | | | | | | 0.06 | 0.01 | 0.03** |
| $R^2$ | 0.21 | | | 0.21 | | | 0.21 | | |
| F for $R^2$ change | 3,228.30** | | | 1.77 | | | 18.89** | | |

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

## *Dichotomous Mark (Scale: Pass/Fail) as Dependent Variable*

**SY 2020-21 Mathematics Q1 Pass/Fail – All students**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | B | *SE* | df | B | *SE* | df | B | *SE* | df |
| TIME 1 Mathematics Q1 Quality Points | 0.84** | 0.01 | 1 | 0.84** | 0.01 | 1 | 0.84 | 0.01 | 1 |
| TIME 1 Mathematics Rigor | 0.11 | 0.02 | 1 | 0.12** | 0.03 | 1 | 0.11 | 0.03 | 1 |
| TIME 2 Mathematics Rigor | | | | -0.18** | 0.04 | 1 | -0.18 | 0.04 | 1 |
| Year | | | | | | | -0.31 | 0.02 | 1 |
| Model $\chi^2$ | 10,161.84** | | | 10,183.00** | | | 10,382.07** | | |
| Model df | 2 | | | 3 | | | 4 | | |

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

**SY 2020-21 Mathematics Q1 Pass/Fail – White students**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | B | *SE* | df | B | *SE* | df | B | *SE* | df |
| TIME 1 Mathematics Q1 Quality Points | 0.83** | 0.02 | 1 | 0.84** | 0.02 | 1 | 0.84** | 0.02 | 1 |
| TIME 1 Mathematics Rigor | 0.04 | 0.06 | 1 | 0.08 | 0.06 | 1 | 0.08 | 0.06 | 1 |
| TIME 2 Mathematics Rigor | | | | -0.14 | 0.04 | 1 | -0.14 | 0.10 | 1 |
| Year | | | | | | | -0.15** | 0.05 | 1 |
| Model $\chi^2$ | 1,802.24** | | | 1,804.20** | | | 1,814.33** | | |
| Model df | 2 | | | 3 | | | 4 | | |

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

**SY 2020-21 Mathematics Q1 Pass/Fail – Black students**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | B | *SE* | df | B | *SE* | df | B | *SE* | df |
| TIME 1 Mathematics Q1 Quality Points | 0.73** | 0.02 | 1 | 0.73** | 0.02 | 1 | 0.73** | 0.02 | 1 |
| TIME 1 Mathematics Rigor | -0.07 | 0.07 | 1 | 0.05 | 0.08 | 1 | 0.04 | 0.08 | 1 |
| TIME 2 Mathematics Rigor | | | | -0.29** | 0.11 | 1 | -0.28** | 0.11 | 1 |
| Year | | | | | | | -0.17** | 0.07 | 1 |
| Model $\chi^2$ | 958.41** | | | 965.69** | | | 973.13** | | |
| Model df | 2 | | | 3 | | | 4 | | |

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

**SY 2020-21 Mathematics Q1 Pass/Fail – Hispanic students**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | B | *SE* | df | B | *SE* | df | B | *SE* | df |
| TIME 1 Mathematics Q1 Quality Points | 0.63** | 0.03 | 1 | 0.63** | 0.01 | 1 | 0.64** | 0.01 | 1 |
| TIME 1 Mathematics Rigor | -0.27** | 0.04 | 1 | -0.13** | 0.04 | 1 | -0.14** | 0.04 | 1 |
| TIME 2 Mathematics Rigor | | | | -0.32** | 0.05 | 1 | -0.32** | 0.05 | 1 |
| Year | | | | | | | -0.43** | 0.03 | 1 |
| Model $\chi^2$ | 2,990.96** | | | 3,028.27** | | | 3,222.42** | | |
| Model df | 2 | | | 3 | | | 4 | | |

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

**SY 2020-21 Mathematics Q1 Pass/Fail – Asian students**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | B | *SE* | df | B | *SE* | df | B | *SE* | df |
| TIME 1 Mathematics Q1 Quality Points | 0.91** | 0.09 | 1 | 0.92** | 0.03 | 1 | 0.92** | 0.03 | 1 |
| TIME 1 Mathematics Rigor | -0.09 | 0.10 | 1 | -0.01 | 0.10 | 1 | -0.01 | 0.10 | 1 |
| TIME 2 Mathematics Rigor | | | | -0.27 | 0.16 | 1 | -0.27 | 0.16 | 1 |
| Year | | | | | | | -0.12 | 0.07 | 1 |
| Model $\chi^2$ | 1,046.71** | | | 1,049.67 | | | 1,052.62** | | |
| Model df | 2 | | | 3 | | | 4 | | |

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

**SY 2020-21 Mathematics Q1 Pass/Fail – Other Race students**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | B | *SE* | df | B | *SE* | df | B | *SE* | df |
| TIME 1 Mathematics Q1 Quality Points | 0.86** | 0.04 | 1 | 0.86** | 0.04 | 1 | 0.86** | 0.04 | 1 |
| TIME 1 Mathematics Rigor | 0.05 | 0.13 | 1 | -0.03 | 0.15 | 1 | -0.04 | 0.15 | 1 |
| TIME 2 Mathematics Rigor | | | | 0.22 | 0.21 | 1 | 0.28 | 0.21 | 1 |
| Year | | | | | | | -0.20 | 0.11 | 1 |
| Model $\chi^2$ | 379.44** | | | 380.51** | | | 383.59** | | |
| Model df | 2 | | | 3 | | | 4 | | |

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

**SY 2020-21 Mathematics Q1 Pass/Fail – Economically Disadvantaged students**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | B | *SE* | df | B | *SE* | df | B | *SE* | df |
| TIME 1 Mathematics Q1 Quality Points | 0.75** | 0.01 | 1 | 0.76** | 0.01 | 1 | 0.76** | 0.01 | 1 |
| TIME 1 Mathematics Rigor | -0.02 | 0.03 | 1 | 0.09* | 0.04 | 1 | 0.08* | 0.04 | 1 |
| TIME 2 Mathematics Rigor | | | | -0.25** | 0.05 | 1 | -0.25** | 0.05 | 1 |
| Year | | | | | | | -0.32** | 0.03 | 1 |
| Model $\chi^2$ | 4,230.25** | | | 4,254.11** | | | 4,361.21** | | |
| Model df | 2 | | | 3 | | | 4 | | |

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

**SY 2020-21 Mathematics Q1 Pass/Fail – English Learner students**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | B | *SE* | df | B | *SE* | df | B | *SE* | df |
| TIME 1 Mathematics Q1 Quality Points | 0.68** | 0.02 | 1 | 0.68** | 0.02 | 1 | 0.69** | 0.02 | 1 |
| TIME 1 Mathematics Rigor | -0.37** | 0.04 | 1 | -0.29** | 0.05 | 1 | -0.31* | 0.05 | 1 |
| TIME 2 Mathematics Rigor | | | | -0.14** | 0.07 | 1 | -0.15** | 0.07 | 1 |
| Year | | | | | | | -0.48** | 0.04 | 1 |
| Model $\chi^2$ | 2,082.49** | | | 2,086.95** | | | 2,222.02** | | |
| Model df | 2 | | | 3 | | | 4 | | |

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

**SY 2020-21 Mathematics Q1 Pass/Fail – Students with Disabilities**

| | Model 1 | | | Model 2 | | | Model 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | B | *SE* | df | B | *SE* | df | B | *SE* | df |
| TIME 1 Mathematics Q1 Quality Points | 0.74** | 0.02 | 1 | 0.74** | 0.02 | 1 | 0.74** | 0.02 | 1 |
| TIME 1 Mathematics Rigor | 0.10* | 0.05 | 1 | 0.16* | 0.06 | 1 | 0.16* | 0.06 | 1 |
| TIME 2 Mathematics Rigor | | | | -0.15** | 0.07 | 1 | -0.15** | 0.07 | 1 |
| Year | | | | | | | -0.30** | 0.05 | 1 |
| Model $\chi^2$ | 1,698.41** | | | 1,702.43** | | | 1,742.82** | | |
| Model df | 2 | | | 3 | | | 4 | | |

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