STUDY OF TEACHING AND LEARNING DURING THE COVID PANDEMIC

Findings from Fall/Winter SY 2020-21

**Office of Research and Strategic Improvement**

March 2021

Background

- Given health recommendations from the Centers for Disease Control (CDC) and local health officials, FCPS began the 2020-21 school year with 100 percent of students receiving virtual instruction and an intent of phasing in face-to-face instruction over time based on needs of different student groups.

- Families were provided a choice whether to continue to receive instruction virtually or return to in-person instruction as health metrics allowed.

- Nine student groups were established to structure return to school as established health and operational metrics allowed, with priority given to special education students, the youngest learners and those early in their English learning.

- At the time of this writing, FCPS has already returned the first four group to in-person instruction, representing those with the highest need for in-person instruction with plans to return all groups of learners that choose in-person instruction to school buildings by mid-March 2021.

- Based on parent choice, approximately 50 percent of FCPS students will remain virtual for the entirety of SY 2020-21.

- This study focuses on the virtual learning that FCPS has offered, as well as the impact FCPS' virtual learning has on student academic and social-emotional outcomes. The study examines how FCPS' distance learning compares to best practices gleaned from research, investigates implementation of these practices, and looks at the extent to which distance learning has helped meet students' academic and social-emotional needs.
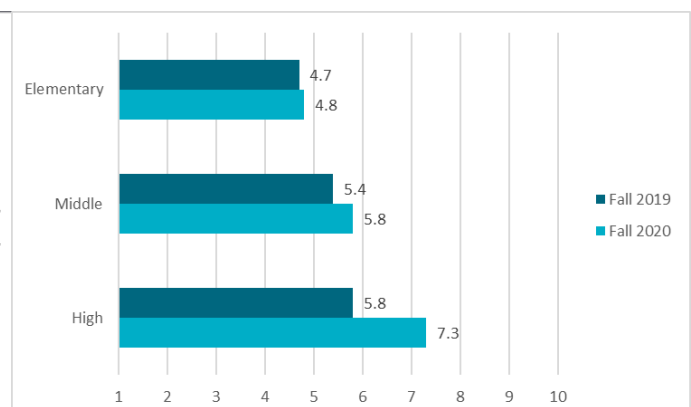
Findings

To what extent did students attain learning outcomes, engage with learning and avoid negative social-emotional outcomes during the first half of SY 2020-21?

- Student marks at all school levels rebounded in Quarter 2 to more closely match performance in prior years, improving on what was observed for Quarter 1.

- Student groups continued to differ considerably in their marks with lower performance among English learner students and students with disabilities at all grade levels when compared to prior years.

- Student stress, especially for high school students, was significantly higher than during the prior year.

- Students reported challenges being engaged with teaching and learning.

STUDENT MARKS RANGES
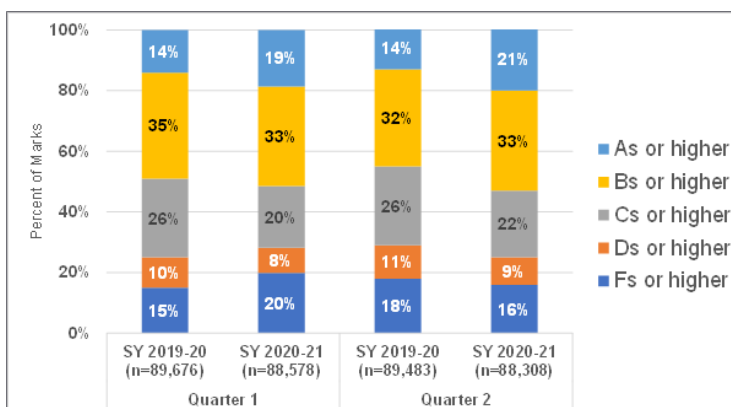
STUDENT STRESS

Findings (continued)

To what extent did FCPS' school-based and central-based efforts support high quality instruction during the first half of SY 2020-21?

- The majority of families, students, and teachers reported satisfaction with the quality of instruction throughout the first half of SY 2020-21.
- While FCPS' approach to virtual learning in the first half of SY 2020-21 reflected the best practice of incorporating both synchronous and asynchronous instruction, the amount of screen time was perceived to be too great at all school levels.
- While FCPS' approach to instruction in the Fall was more closely aligned to the eight research-based elements than last spring, expectations around the TPACK element continue to need more clarity and definition.
- There was a lack of coordination for developing and disseminating instructional resources that reflect TPACK instruction that would meet the needs of all learners, leaving teachers without sufficient supports to design differentiated lessons and assess learning in a virtual environment.
- Staff and parent perceptions of implementation of the research-based TPACK elements were primarily positive. However, student perceptions of the instruction they received were significantly less positive than those of staff or parents.
- Lack of feedback from teachers to students was viewed as having a negative impact on learning.
- Student perceptions of student-teacher relationships were meaningfully lower than perceptions of other stakeholders. However, teachers that made students feel valued and adjusted based on feedback were well received by students and families.
- Most teachers reported that they had the resources needed to teach social-emotional skills but expressed less confidence identifying students in crises.

To what extent was stronger instruction with the eight research-based elements tied to better student outcomes?

- Student-teacher relationships and respect for student voice were essential elements for students to meaningfully engage in classroom learning.
- Students' engagement and outcomes were positively affected when the research-based elements were addressed.

Conclusions

With the additional time available to FCPS since the COVID-19 pandemic began, the Division was able to more fully develop resources and prepare staff for effective virtual instruction and support for students' social-emotional needs during the 2020-21 school year than it had been able to stand up at the end of the prior year.

As the year progressed, FCPS students appear to be attaining better academic outcomes, likely signaling greater adaptation of staff, students, and families to the virtual learning context.

Recent student performance data does not reflect learning loss for most students, though English learners have demonstrated less success in the virtual environment and will need greater supports moving forward to improve outcomes.

FCPS' ability to meet the needs of students who are experiencing academic challenges, such as many of our English learner students, will be limited unless the Division attends to staffs' capacity to accurately assess learning.

The professional development focused on student's social-emotional learning received by teachers at the start of this school year and related supports implemented by schools have not been able to counter the stress students are experiencing.

While most students are performing relatively well academically, FCPS should be concerned about student engagement during learning within a virtual environment, especially given that approximately 50 percent of students will continue to learn virtually throughout this year.

Weakened student-teacher relationships may have long-lasting impacts if a better balance between virtual classroom management and social/communication factors is not achieved.

With approximately 50 percent of students continuing to learn virtually, equity in instruction will continue to be an issue without high-quality exemplars of virtual instruction that reflects TPACK across the content areas, school levels, and for groups of students with unique learning needs.

Recommendations

1. Continue to develop the understanding of school- and central-based staff involved in virtual or concurrent instruction with an understanding of principles behind effective virtual instruction that reflect the eight research based elements, especially the integration of technology, pedagogy, and content that yields engaged learners.
2. Develop a framework to guide teachers through the decision-making process needed to plan virtual academic and social-emotional learning lessons that guides them in matching pedagogy to content and the integration of technology, including equitable delivery of differentiated content to diverse learners.
3. Enhance supports for basic needs, well-being, and academics for any student struggling in these areas, focusing, in particular, on English learner students.
4. Adjust guidance on classroom management to ensure it does not overpower building positive student-teacher relationships.
5. Ensure teachers have sufficient capacity to assess their students both formatively and summatively within a virtual environment and to provide timely feedback to students that supports their learning.
6. Address student workload issues to decrease student stress, whether students are in-person or virtual.

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Introduction

In August of 2020, school systems across the United States faced the decision of whether to offer face-to-face instruction, virtual instruction, or some hybrid of the two to start the 2020-21 school year, as the COVID-19 pandemic continued its grip on the nation. This decision was made after most school systems had provided all virtual instruction in Spring 2020 of the prior school year. Given health recommendations from the Centers for Disease Control (CDC) and local health officials, FCPS began the 2020-21 school year with 100 percent of students receiving virtual instruction and an intent of phasing in face-to-face instruction over time based on needs of different student groups. Families were provided a choice whether to continue to receive instruction virtually or return to in-person instruction as health metrics allowed. Over the course of fall 2020, nine student groups were established to structure return to in-person instruction as established health and operational metrics allowed, with priority given to special education students, the youngest learners and those early in their English learning. At the time of this writing, FCPS has already returned the first four group to in-person instruction, representing those with the highest need for in-person instruction with plans to return all groups of learners that choose in-person instruction to school buildings by mid-March 2021. Based on parent choice, approximately 50 percent of FCPS students will remain virtual for the entirety of SY 2020-21.

This study seeks to determine the quality of the instruction and learning in FCPS during the COVID-19 pandemic. In particular, the study, which was initiated when the original shift to virtual instruction began last Spring, focuses on the virtual learning that FCPS has offered and the impact FCPS' virtual learning has on student academic and social-emotional outcomes, both in spring 2020, as well as moving forward into the 2020-21 school year. The study examines how FCPS' distance learning compares to best practices gleaned from research, investigates implementation of these practices, looks at the extent to which distance learning has helped meet academic and social-emotional needs, and considers distance learning costs. Ideally, the conclusions of the teaching and learning study will provide insights that allow FCPS to improve its teaching and learning efforts toward the aspiration of offering virtual instruction that is as effective as the in-person instruction the Division has offered traditionally. The results of the study can be used by FCPS leadership and departments to plan any needed future virtual learning as well as by the School Board to address any policy or funding implications.

The current report, which is the second evaluation report to be released from the study, focuses on teaching and learning during the fall of 2020. It is intended to capture the activities FCPS engaged in from July 2020 through January 2021 to deliver high quality virtual instruction. It examines how closely FCPS' approach to virtual learning reflects the literature and common practices for high quality virtual instruction, what outcomes are being demonstrated by FCPS students, and the relation between the two.

Study Design

To inform the design, the Office of Research and Strategic Improvement (ORSI) developed an initial set of study questions, which form the basis of this report. The study design and survey instruments were shared with an advisory team comprising central office staff, school-based staff and members from select community groups.

The study design focuses around four questions:

1. To what extent was FCPS' distance learning approach designed to address student achievement needs, social-emotional needs, and equity concerns?

2. To what extent did FCPS' school-based and central-based efforts support high quality virtual instruction?

3. To what extent did students attain learning outcomes, avoid negative social-emotional outcomes, and engage with learning?

4. How did the cost of distance learning compare to traditional school operations? *(This question will be addressed in the final study report)*

This interim report covers the first three study questions based on data collected during the first two quarters of SY 2020-21. The final report is expected in Fall 2021 will focus on summative findings for all four study questions during Spring 2020 and SY 2020-21. (See Appendix A for additional details on the study design.)

Highlights from Study Report 1 (Spring 2020 Data)

Based on data collected through surveys, focus groups, and interviews, the following conclusions were drawn regarding FCPS' provision of instructional and other services, as well as student outcomes, during Spring 2020:

- **FCPS plans for Spring 2020 addressed many of the basic challenges that arose after the Governor's order to close schools, focusing on equity and the Division's Caring Culture goal.** Spring 2020 actions ensured the provision of nutritional meals to thousands of students who typically receive free- or reduced-price meals at school, attended to social-emotional well-being of both students and staff during the stress of the COVID-19 pandemic, focused on maintenance of a family-school bond, and recognized the need for greater emphasis on technology in virtual instruction than had been typical for in-person instruction. FCPS also used an equity lens in its decision-making around instruction, such as the decision not to grade students for fourth quarter learning.

- **Expectations for instruction accommodated the suddenness of the change to virtual instruction more so than adjusting to what would be needed for high quality virtual instruction.** During Spring 2020, FCPS set instructional expectations that at a broad level were aligned with effective virtual instruction (e.g., relying on both synchronous and asynchronous instruction) but without sufficient expectation setting of what synchronous and asynchronous instruction should look like (e.g., the importance of peer to peer interactions as part of synchronous instruction). Even the main instructional goal that was part of the FCPS Distance Learning plan indicated learning should continue to the greatest extent possible, with no definition of what that meant. As one focus group participant indicated, it was like teachers were told go do your best with little expectation that the best would be sufficient to instruct effectively.

- **FCPS' Spring 2020 centralized approach to develop teacher competencies for virtual instruction was limited to a one-day course about using the technology platform so schools and teachers were largely left to figure things out on their own.** For years, research and theory on effective instruction has touted the importance of pedagogical content knowledge (PCK). This type of knowledge is more than just the combination of pedagogy and content knowledge added together. Rather PCK is the integration of the two into knowledge the teacher can apply to teach the specific content to the student, pulling from the teacher toolbox the specific instructional strategies best suited to the situation. To that perspective, more recent research and theory on effective instruction has added technological knowledge as a separate component that then integrates with PCK into technological pedagogical and content knowledge (TPACK). TPACK requires the teacher have technology knowledge (i.e., knowledge of technology tools and their capabilities) but more broadly reflects teachers' knowledge of how to teach the specific content to the student using the appropriate technological tools, pulling from the teacher toolbox the instructional and technological strategies best suited to the situation. Within a distance learning situation, TPACK is no longer a nice to have addition beyond PCK but a necessary one. During Spring 2020, largely through efforts at individual schools, some additional professional development was offered that aimed to enhance teacher's knowledge and skills for use of technology tools and support development of TPACK among teachers. Across the Division, however, there were no specific offerings to grow TPACK skills in teachers. The most equitable things we can do is to ensure high quality rigorous instruction for all students. Therefore, all FCPS teachers engaged in virtual instruction will need TPACK for distance learning to become an effective substitute for in-person learning for all students.

- **FCPS' current instructional framework of best practice (FCPS Learning Model) is a good reflection of PCK but not TPACK.** With FCPS relying on in-person learning for the vast majority of its instruction prior to the COVID-19 pandemic, the lack of fully integrating technological knowledge into the framework's resources was not surprising and not necessarily missed. Historically, schools had resource positions, namely School-based Technology Specialists (SBTS), who could support the integration of technology and support development of TPACK in teachers. However, the pressing need for virtual instruction after the COVID closure left schools struggling to provide consistent high-quality learner-centered instruction efficiently. With a scarcity of high-quality curriculum and instructional resources that modeled best practice in distance learning, individual school-based instructional staff spent many hours developing their own resources. While there was some sharing of resources among SBTS and Instructional Coaches, for the most part each school had to define what constituted high quality synchronous and asynchronous instruction and learn how to use and integrate technology tools to deliver that instruction. Given the demand of developing synchronous and asynchronous instruction, this approach is not sustainable nor equitable in the long term. This also means that central office content and curriculum experts need to become well-versed in TPACK so that they can integrate technological aspects of instruction and a virtual classroom more overtly into the FCPS Learning Model, as well as provide useful central resources in support of virtual instruction. It is unclear whether FCPS possesses sufficient TPACK capacity to handle the training of school- and central-based staff with instructional and content responsibilities on TPACK in a virtual environment. Online Campus program staff are the primary staff who had to do so in the past and their development of TPACK in teachers has been within a context of a narrower set of content, grades, and types of students than exists when FCPS must provide virtual instruction to all students. Nonetheless, the resources FCPS already possesses in this regard, such as Online Campus and Integrated Technology program staff, should be leveraged to the greatest extent possible.

- **While FCPS aimed for equity in its plan, equity of access and communication remained a concern with some student groups**. Inequities in technology access limited the benefits of asynchronous and synchronous instruction for some student groups, even with efforts to provide devices and internet access to students who did not have it already available. Similarly, the virtual environment itself proved a challenge for some students to access instruction, especially students with disabilities and English learners. The challenge with English learners was compounded by communication problems with both students and parents, which often required translated messages or a translator for a phone call. The importance of school-family relationships was particularly important for overcoming these challenges but success varied by school, teachers, student, and family.

- **Equitable benefits from virtual learning are unlikely unless FCPS addresses student engagement and self-direction skills.** Virtual environments make different demands on students than in-person instruction. Online Campus historically screened students for characteristics matched to the demands of a virtual course. The COVID-19 pandemic, however, meant that screening was not a possibility and that students across a continuum of these characteristics and ages would be participating in virtual instruction. In the virtual environment, adult oversight can no longer be relied upon to motivate student participation. Further, even students with low levels of executive functioning need to access instructional resources easily, manage their time in asynchronous learning, and develop a myriad of other self-regulating skills to learn effectively. Addressing these student motivation and executive functioning skills is also critical to FCPS' provision of effective virtual instruction to all students. Some of this can happen on the staff side in terms of using engaging activities and organizing learning for students. Since FCPS does not have the latitude to pick who gets virtual instruction as it did previously with Online Campus, explicit development of greater self-direction skills (i.e., executive functioning, metacognition) in students is likely needed for all students to learn effectively in a virtual environment. This is another important aspect of instruction that would best be conceptualized centrally for efficiency and equity. Thus, FCPS needs a plan for developing staff competencies that promote student engagement and lower the load on student executive functioning demands but also a plan for promoting greater self-regulation and metacognitive skills in students.

- **Creating effective virtual instruction in FCPS will take time and continual improvement.** Effective virtual instruction is different from effective in-person instruction. As described above, it requires different competencies from both teachers and students than those needed for in-person instruction. In other words, this is new territory for FCPS, as it is for other school districts. Also, as described above, FCPS' initial Spring 2020 Distance Learning offering was not designed or implemented to support

strong student outcomes. Layer on top of those factors the known equity issues, the need to build up TPACK competencies throughout the Division, and the scarcity of models and resources for effective virtual instruction. Virtual instruction in SY 2020-21 will remain a major challenge for FCPS and FCPS is likely to continue to deliver instruction that is not as effective as what it could offer in-person. Ensuring that community expectations don't outpace this reality will be important. This also means that FCPS would benefit from incorporating a centralized continual improvement approach to implementation of further virtual instruction. That is, central office should predetermine a framework for collecting information on how virtual instruction is working and for making improvements based on the collected information. Assessment of student learning will be a critical component of this data collection. Further, virtual instruction theory and research has highlighted the importance of collecting student feedback in these types of endeavors, so FCPS should make sure to develop a feedback mechanism that not only gathers information from teachers and parents, but also from students who are intended to be the primary beneficiaries of FCPS' virtual instruction.

Data Sources

Evidence for the current report, which investigated FCPS' functioning in the first half of SY 2020-21, relied upon a variety of quantitative and qualitative data to inform the findings and conclusions. When beginning this study in Spring 2020, a review of the research literature and common practices was conducted to develop an understanding of how to design and implement virtual learning to best support student academic and well-being. Additionally, moving into SY 2020-21, ORSI relied upon the following data sources:

- To understand division expectations for teaching and learning during SY 2020-21, ORSI undertook a document review (including review of FCPS' Return to School documents, communications to parents, and individual department documents) and conducted electronic interviews with central office staff.

- To assess school and staff practices, ORSI gathered information from central office staff, teachers, principals, directors of student services, counselors, social workers, and psychologists, as well as students, and caregivers through online interviews, surveys, and focus groups.

- Lastly, student outcome data analyzed for this report included student grades and standardized assessments to assess academic performance, along with perceptual data regarding student engagement, student learning, and social-emotional well-being.

Quarter 1 student marks were presented in a report to the School Board in the November 20, 2020 Brabrand Briefing and in the December 10, 2020 Return to School Presentation. (See Appendix B for a more detailed description of the study's methodology and data collection).

Findings

Student Outcomes

This section of the report presents a picture of student outcomes in the first half of SY 2020-21. It relies on analyses of student assessment data, as well as surveys and focus groups with teachers, families, and students to determine the extent to which students were engaged in learning and attaining academic and social-emotional outcomes.

Study Question 1: To what extent did students attain learning outcomes, engage with learning and avoid negative social-emotional outcomes during the first half of SY 2020-21?

| Summary of Findings |
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| - Student marks at all school levels rebounded in Quarter 2 to more closely match performance in prior years, improving on what was observed for Quarter 1. |

- Student groups continued to differ considerably in their marks with lower performance among English learner students and students with disabilities at all grade levels when compared to prior years.
- Student stress, especially for high school students, was significantly higher than during the prior year.
- Students reported challenges being engaged with teaching and learning.

Finding 1. Overall, student marks at all school levels (elementary, middle, high) rebounded in Quarter 2 to more closely match performance in prior years, improving upon the lower than typical marks performance found for Quarter 1.

Middle and High School Marks

The majority of marks for all students at middle and high school were in the A/B range in Quarter 2 this year (78 percent), as had been true in Quarter 1 (78 percent), and similar to what was observed in the prior school year for Quarter 1 (79 percent) or Quarter 2 (78 percent) (Figure 1). However, unlike at Quarter 1, the percentage of D/F marks this year (10 percent) was comparable to those in the prior year (9 percent). This was an improvement over Quarter 1 of this year when the percentage of D/F marks was meaningfully higher (11 percent) than in the prior year (7 percent); the magnitude of that change was small (Quarter 1 to Quarter ES[1]=.10; Quarter 2 2019-20 to Quarter 2 2020-21 ES=.14).

Figure 1: Distribution of Middle and High School Marks in Quarters 1 and 2, SY 2019-20 and SY 2020-21

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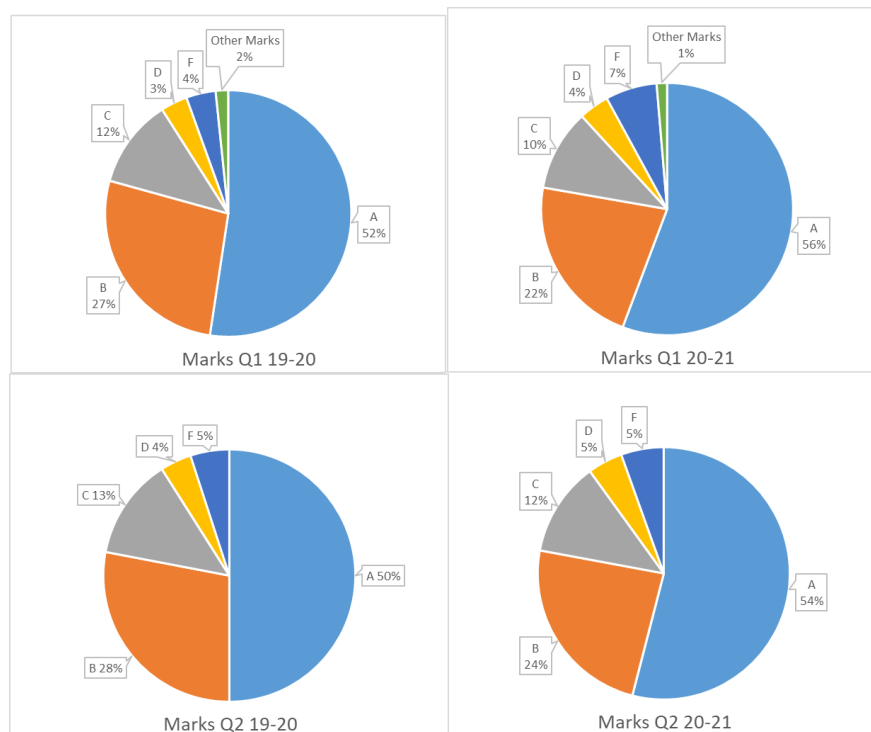
[1] Effect sizes are provided only when there are significant differences (α < 0.05) between the groups. The National Center for Special Education Research (NCSER) suggests that when it comes to interpreting effect sizes, Cohen's (1988) traditional categories of small (0.2), medium (0.5), and large (0.8) 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.

Looking more closely at the pattern of marks observed for individual students, the majority of students (54 percent) had either all As or Bs in Quarter 2 this year. This was higher than what was observed in Quarter 1 this year (52 percent) or in Quarter 2 of the prior year (46 percent), indicating more high performing students (Figure 2). Additionally, the percentage of students with at least one D or F showed a decrease from 28 percent in Quarter 1 to 25 percent in Quarter 2, once again indicating improved performance at Quarter 2. Additionally, the percentage of students receiving at least one D or F in Quarter 2 was lower this year than last year (29 percent). The magnitude of the differences in the percentage of students with at least one D or F was small (Quarter 1 to Quarter 2 ES=.10; Quarter 2 2019-20 to Quarter 2 2020-21 ES<.10).

Figure 2: Secondary Student Performance Across Courses, Quarters 1 and 2, 2019-20 and SY 2020-21
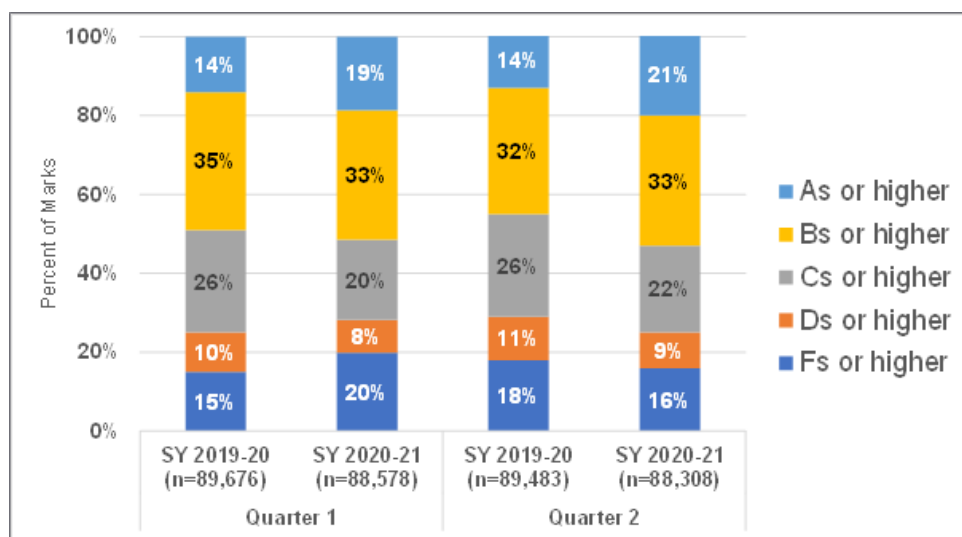
When matching student performance in the first quarter to that in the second quarter, the majority of middle and high students maintained or improved performance across their courses. Approximately two-thirds of students maintained their performance in courses from Quarter 1 to Quarter 2. Approximately one-quarter of students improved their performance. The remainder of students (14.6 percent) saw their performance across courses decrease between the two quarters this year (Figure 3).

Figure 3: Change in Secondary Student Marks, Quarter 1 to Quarter 2, SY 2020-21
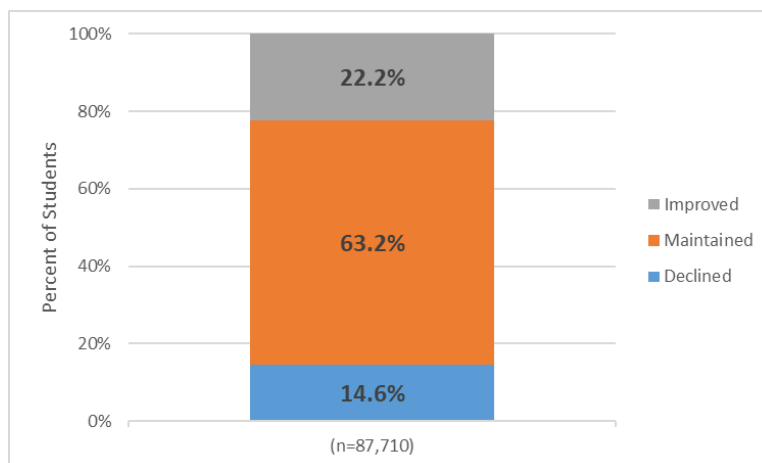
Elementary School Marks

At the elementary level, standards-based grading has been in use in FCPS since SY 2012-13[2]. Although the type of grading differs at the elementary level, elementary marks still reflected a similar picture to that seen at the middle and high school levels. Specifically decreased performance in comparison to prior years for the first quarter and improved performance in the second quarter. For example, elementary Language Arts marks showed decreased percentages of students mastering grade level standards in the first quarter as shown by the percent of 4 and 3 marks (51 percent this year vs. 66 percent last year; ES=.30). Performance in the second quarter increased with similar percentage of 4s and 3s (67 percent) as in prior years (66 percent; ES<.10). However, more standards were not assessed (NA) or not taught (NT) than in prior years (Figure 4). Similar patterns were observed for other content areas (Appendix C).

Figure 4: Distribution of Elementary Language Arts Marks, Quarters 1 and 2, SY 2019-20 and SY 2020-21
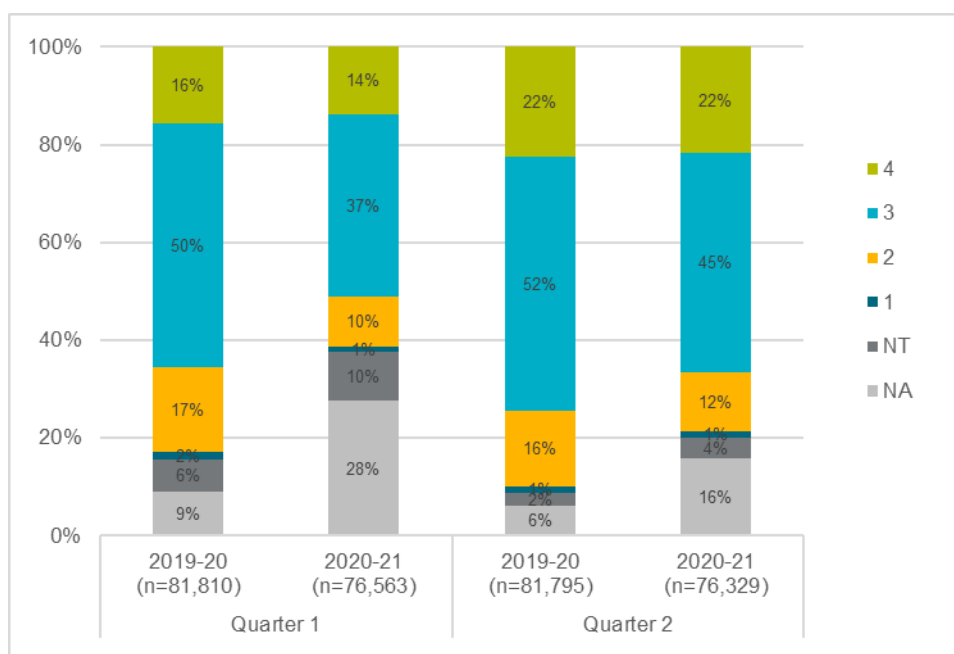
Change in elementary marks from quarter 1 to quarter 2 was not analyzed due to the large percentage of standards not taught or not assessed in quarter 1 and the change in standards taught and assessed between quarters.

Finding 2. Student groups continued to differ considerably in their marks with lower performance among English learner students and students with disabilities at all grade levels when compared to prior years.

Middle and High School Marks

While overall marks performance was better in Quarter 2 than what was seen during Quarter 1 of this year, the patterns of performance in Quarter 2 continued to show lower performance for some student groups. Majorities of Asian and White students earned all As or Bs or higher (71 and 60 percent, respectively), while lower percentages of Black and Hispanic students (42 and 29 percent, respectively) did so. The magnitude

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[2] Achievement marks are reported on a 4-point scale and cannot be equated to letter grades. A grade of "4" indicates a high level of achievement; it communicates that a student has a strong understanding of all the concepts and skills taught for that standard during the quarter and can demonstrate understanding independently and with very few errors. Content areas in which the student is not instructed will be marked with "nt," indicating that the standard was "not taught." For more information on elementary grading, please refer to the FCPS Grading and Reporting website.

of these differences were large (ES>.6). In fact, the majority of Hispanic students (51 percent) had at least one D or F (Figure 5). These differences in the performance of racial/ethnic groups during Quarter 2 were similar to those observed in Quarter 1 of this year (see Appendix C). However, these differences between racial/ethnic student groups have existed previously and are not specific to the current year. Looking at Quarter 2 marks in SY 2020-21 compared to SY 2019-20, all racial/ethnic groups maintained or increased the percentage of students with As or Bs or higher in SY 2020-21. The increases from SY 2019-20 to SY 2020-21 the two years in the percentage of students earning all As or Bs or higher were especially marked for Asian students (55 versus 71 percent) and Black students (36 versus 42 percent year) meaning that students in these groups were primarily responsible for the improvements seen overall in FCPS when comparing last year's marks to this year's. For most student racial/ethnic groups, the percentages of students with at least one D or F were similar in the two school years. However, on the less positive side, the percentage of students with at least one D or F was meaningfully higher this year among Hispanic students (43 versus 51 percent; Figure 5).

**Figure 5: Secondary Student Performance,
Quarter 2 SY 2019-20 and 2020-21 by Race/Ethnicity**
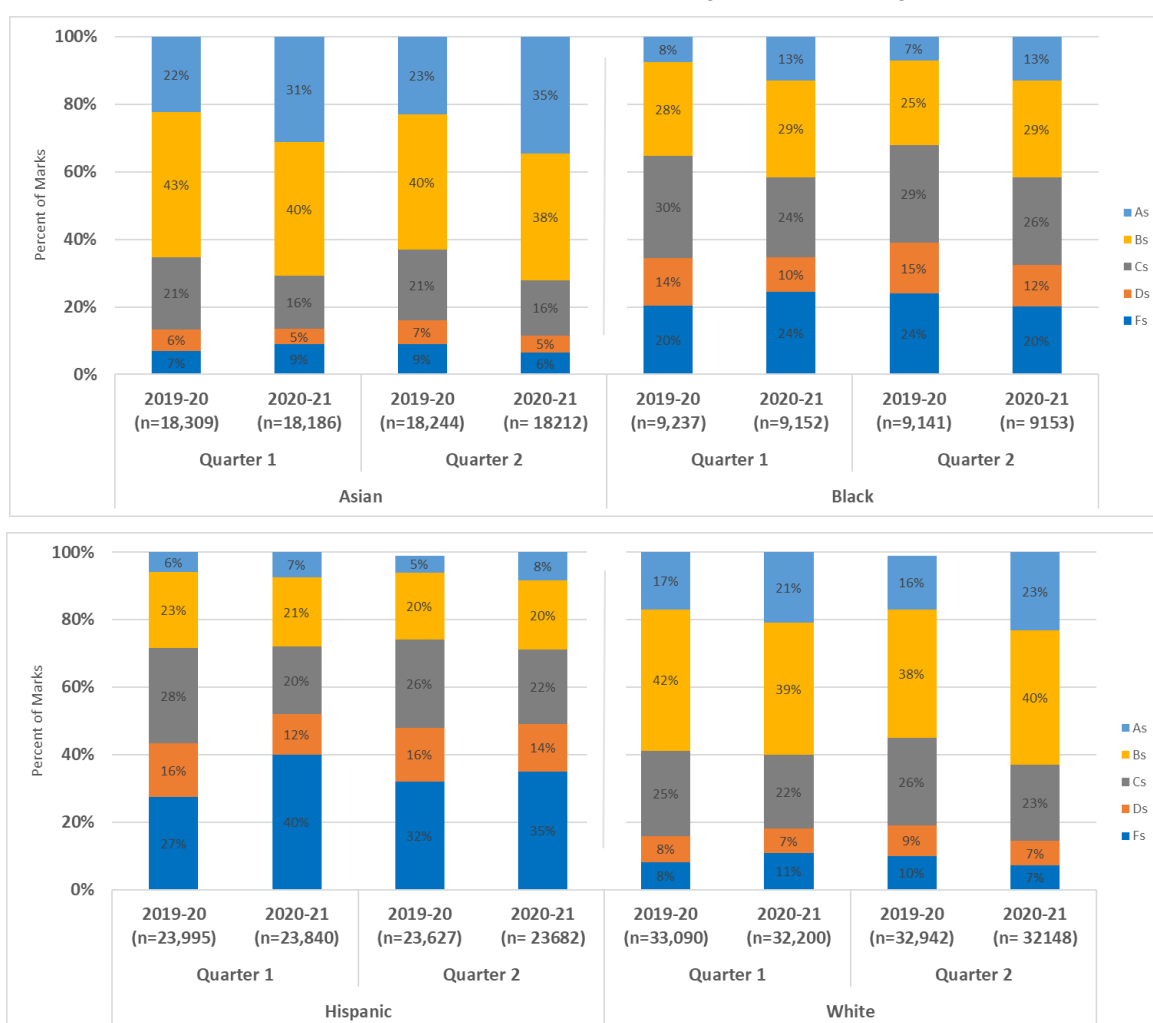
Patterns of lower performance were also observed for students receiving free/reduced price meals, English learners, and students with disabilities. The large majority of English learners (66 percent) had at least one D or F in Quarter 2 of SY 2020-21. This represents an increase from SY 2019-20 (53 percent; Figure 6).

Figure 6: Secondary Student Performance, Quarter 2 SY 2020-21 by Student Group[3]
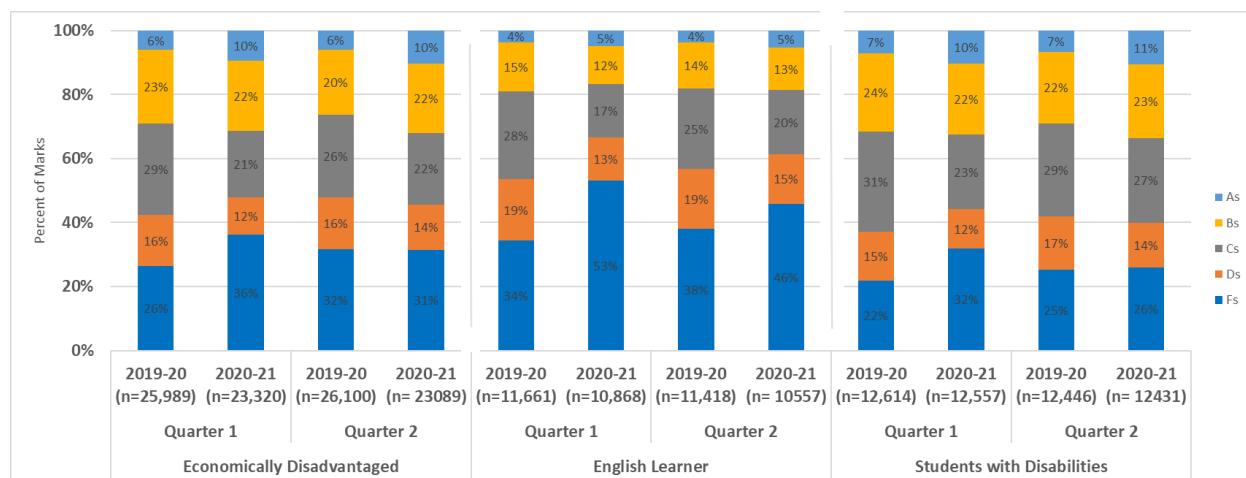
When matching student performance in the first quarter to that in second quarter, similar patterns were observed for all student groups with the large majority of students maintaining their performance across courses and small percentages of students either improving or decreasing (Figure 7).

Figure 7: Change in Secondary Student Marks by Student Group, Quarter 1 to Quarter 2, SY 2020-21
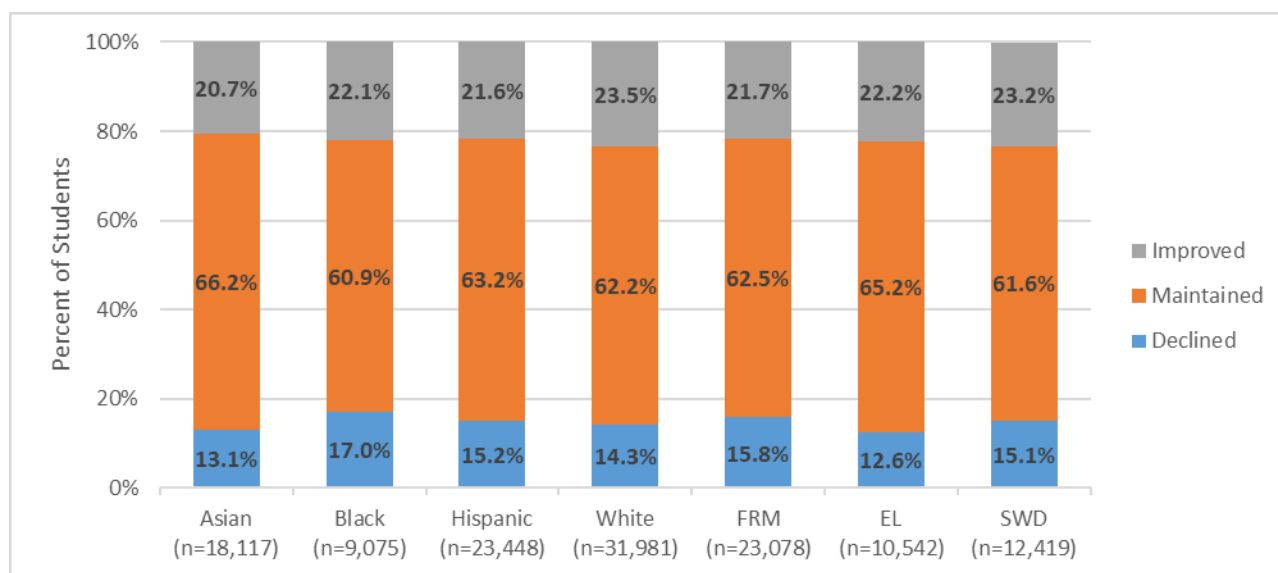
The demographics of students whose performance improved or declined was similar to the division demographics. Of those students whose performance improved, the percentages of students with disabilities and the percentage of students by English learner status were proportional to that of the overall division while the percentage of economically disadvantaged students were slightly under-represented. The percentage of White students were slightly over-represented while Asian students were slightly over-represented. The percentage of Black and Hispanic students whose marks improved were proportional to the division population. Of those students whose performance declined, the percentages of students with disabilities were proportional to that of the overall division while the percentage of students by English

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[3] The abbreviations in this graphic and throughout the remainder of this report reflect the following student groups: FRM refers to economically disadvantaged students; EL refers to English learner students; SWD refers to students with disabilities.

learner status and economically disadvantages were slightly under-represented. The percentage of Asian students and White students were slightly under-represented while Black and Hispanic students were slightly over-represented. (Table 1)

Table 1: Comparisons of Demographics for Students Whose Performance Declined and Overall Demographics

	Asian	Black	Hispanic	White	FRM	EL	SWD
Percent in Improved Marks (n=19,500)	19.2	10.3	25.9	38.6	25.7	12.0	14.8
Percent in Maintained Marks (n=55,416)	21.7	10.0	26.7	35.9	26.0	12.4	13.8
Percent in Declined Marks (n=12,794)	18.5	12.1	27.9	35.6	28.5	10.4	14.7
Percent in Membership (n=88,666)	20.6	10.4	26.7	36.5	32.6	12.3	14.8

Elementary Marks

Analyses of elementary language arts marks showed that all student groups increased the percentage of 4 and 3 marks in quarters 1 and 2 of SY 2020-21 (Figures 8 and 9). This mirrored the pattern shown for the division overall. However, the data show achievement gaps in marks existed prior to SY 2020-21 and continued to exist. Additional detail on mathematics, social studies, and science marks are provided in Appendix C.

Figure 8: Elementary Language Arts Marks by Race/Ethnicity
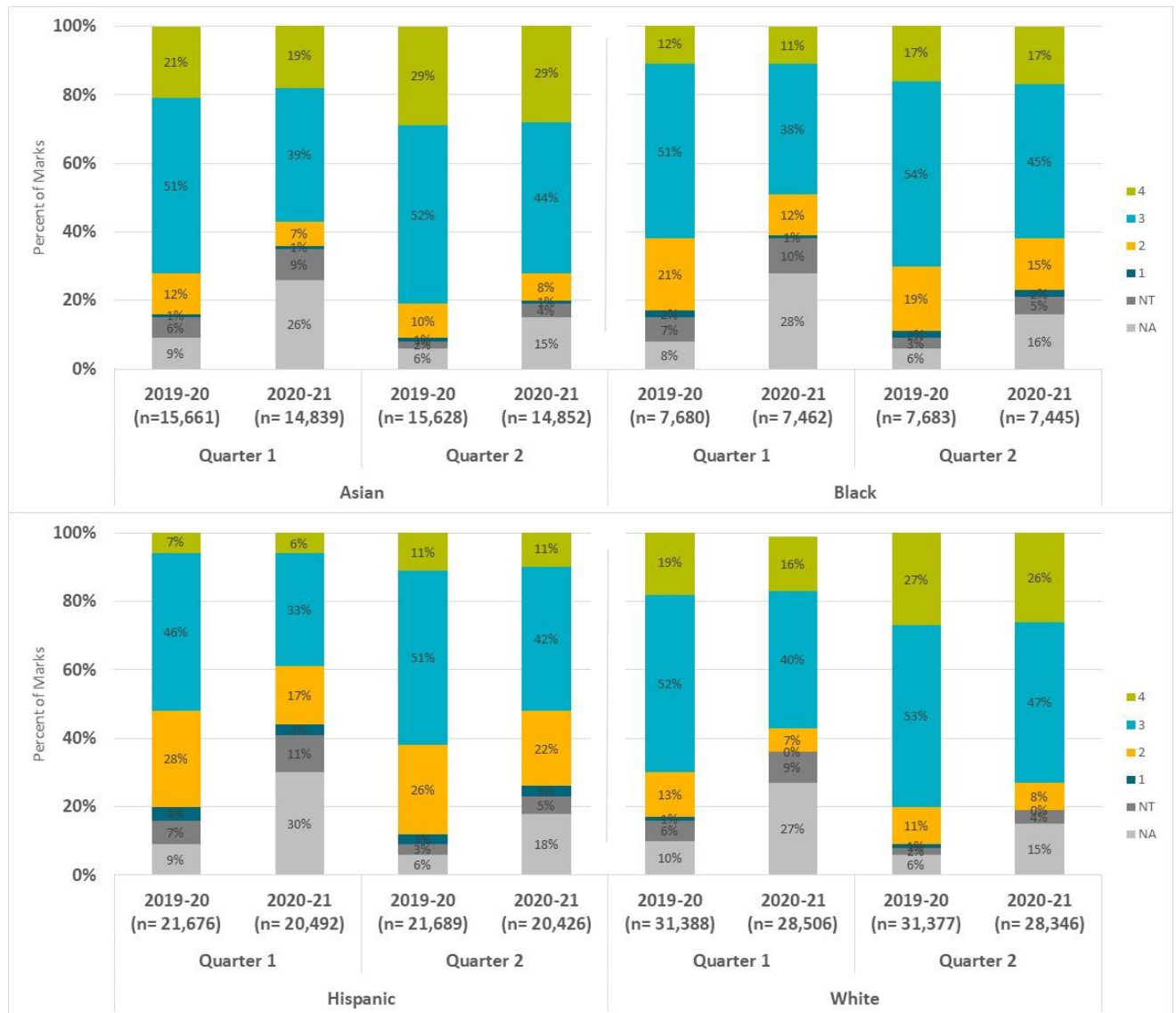
Figure 9: Elementary Language Arts Marks by Student Group
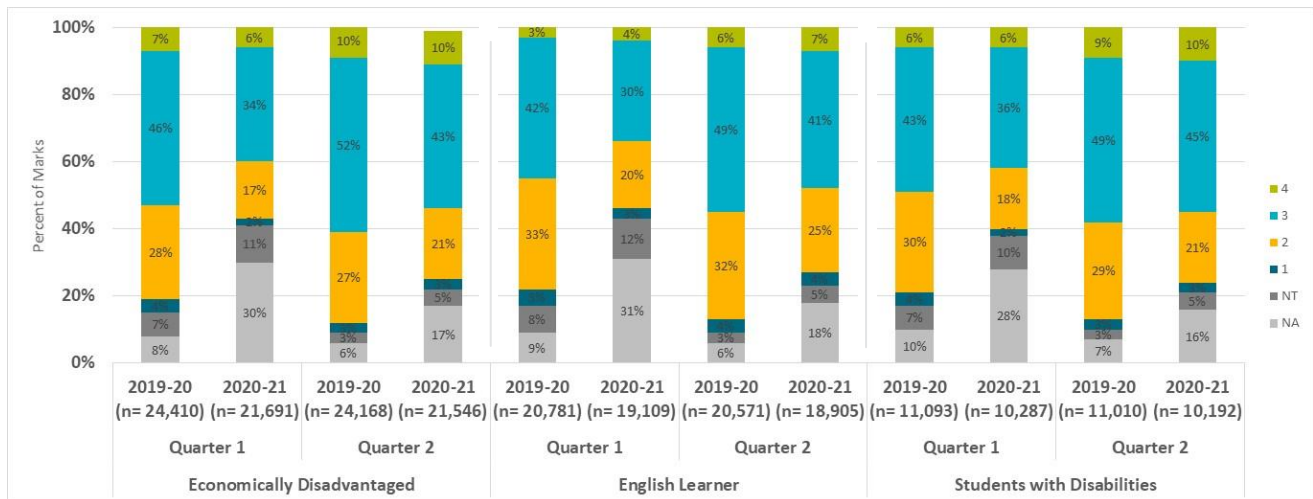
Finding 3. Elementary performance on benchmarked assessments of achievement (iReady Universal Screener, reading on grade level) was similar to performance in prior years.

The study also looked beyond content mastery as demonstrated by marks at the elementary level to external benchmarks of performance. Specifically, the study looked at the extent to which students were reading on grade level (as assessed by teachers based on the level of instructional materials used in classroom instruction and reported on the elementary progress report) and the extent to which students met the fall benchmarks on the iReady Universal Screener assessments used to screen students for interventions. Typically, iReady assessments of reading performance are seen as more objective assessments of reading performance since they are compared to a standardized benchmark than an assessment based on the grade level of differentiated instructional materials used by the classroom teacher. However, in Fall 2020 the iReady assessments were administered during synchronous instruction with students at home potentially receiving support from adults in ways that did not match assessment conditions in other years.

Overall, elementary student performance on the Universal Screener (iReady) assessment in Fall 2020 indicated that similar percentages of students met the reading and mathematics benchmarks as in prior years (Figure 10). Following a similar pattern to the marks data, iReady performance varied by student groups in Fall 2020 with greater percentages of Asian and White students at or above benchmark levels of performance than percentages of Black and Hispanic peers (84 and 82 percent vs 66 and 45 percent, respectively, in reading; 86 and 82 percent vs 62 and 47 percent, respectively, in mathematics). Additionally, economically disadvantaged students demonstrated, English learner students, and students with disabilities had lower percentages of students meeting benchmarks in Fall 2020 (46, 25, and 45 percent, respectively, in reading; 48, 39, and 48 percent, respectively, in mathematics). These differences between student groups were similar to those in prior years (see Figures C-8 and C-9 in Appendix C). These data indicate that Fall 2020 performance on the iReady Universal Screener was mostly similar to prior years both in the level of performance and the existence of considerable differences in performance between student groups. One notable difference, however, is the smaller percentage of FCPS' elementary English learner students who performed at or above the reading benchmark this year compared to last year (34 percent in Fall 2019 versus 25 percent in Fall 2020).

Figure 10: iReady Benchmark Performance, Reading and Math, SY 2018-19, SY 2019-20 and SY 2020-21
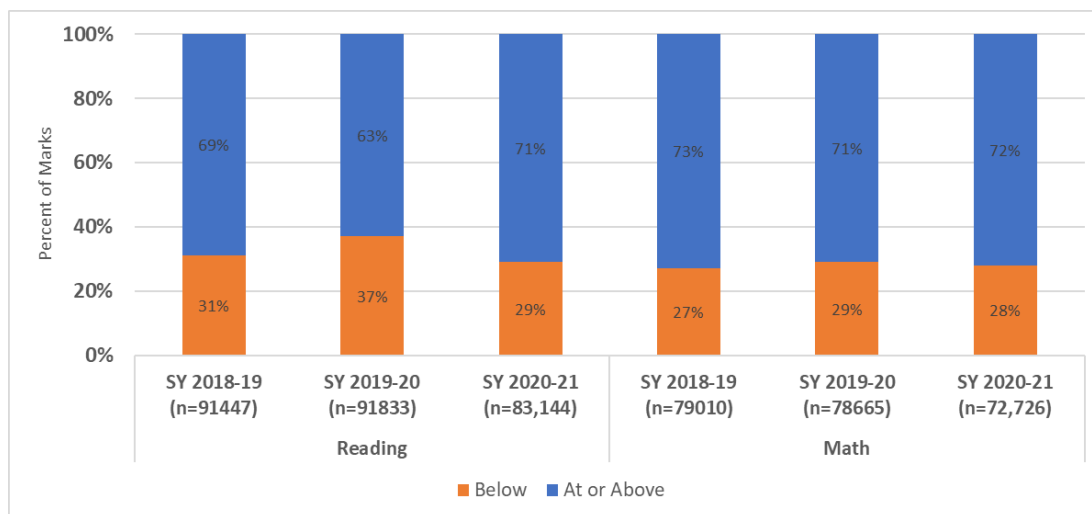
The data on the second benchmarked assessment showed that comparable percentages of students were reading on grade level in the second quarter as in prior years. Approximately 87 percent of elementary students were assessed as reading at or above grade level in Quarter 2, which is comparable to the 84 percent reading at or above grade level in Quarter 2 in prior years and the 85 percent reading at or above grade level in Quarter 1 in years prior. In Quarter 1 of SY 2020-21, the majority of students were not assessed in this area (Figure 11).

Figure 11: Elementary Reading on Grade Level Progress Report Mark, Quarter 1 and 2, SY SY 2019-20 and SY 2020-21
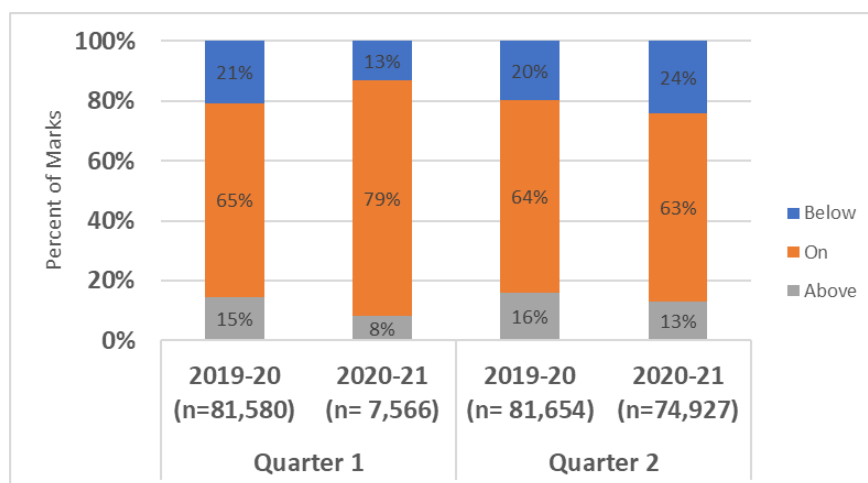
Finding 4. Student stress levels were higher than reported on the Fairfax County Youth Survey in prior years, particularly among high school students.

As a part of the comprehensive student surveys that were administered in December 2020, students were asked to respond to a question regarding student stress. The question, which typically appears on the Fairfax County Youth Survey, asked students to rate their stress level from 1 (low) to 10 (high). Students at all three school levels reported elevated stress levels this year compared to last year, with the largest difference reported by high school students (average stress level of 5.8 in Fall 2019 versus 7.3 in Fall 2020; Figure 12). The magnitude of the difference between Fall 2019 and Fall 2020 in average stress levels was

large for high school students (*ES*=.60), small at middle school (*ES*=.17), and not meaningful at the elementary level (*ES*=.05).

Figure 12: Student Reported Stress by School Level, Fall 2019 and 2020
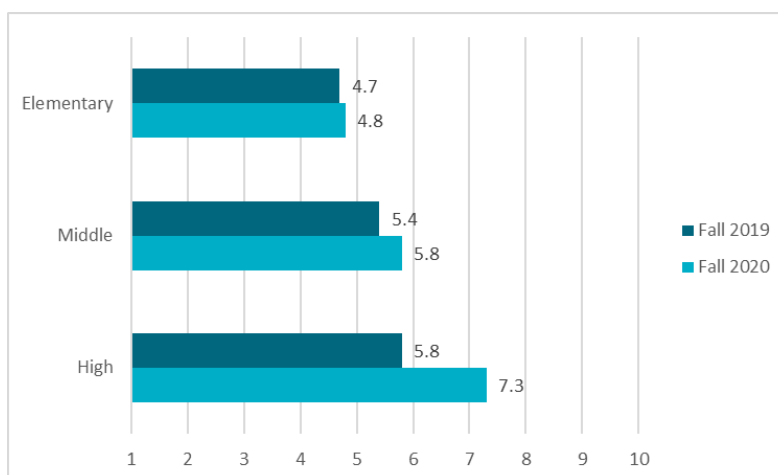
Levels of stress of 8, 9, or 10 are classified as high stress on the Fairfax County Youth Survey. Approximately 54 percent of high school students reported high stress in Fall 2020 compared to 29 percent of middle and 17 percent of elementary students. There were small differences in stress level by student group with White, Asian, and Hispanic students reporting higher levels of stress than Black students (6.8, 6.7, and 6.7 vs 6.6, respectively), however the magnitude of the differences between student groups were not meaningful (*ES*<.1). Students with disabilities reported lower stress than their peers (6.2 vs 6.8, *ES*=.2) as did English learners (6.0 vs 6.8, *ES*=.3). There were no differences by socio-economic status.

Digging a little deeper into the reasons for the heightened stress this year, the majority of middle and high school students (68 percent, n=38) participating in focus groups reported that the amount of schoolwork and the lack of separation between school and home were major contributors to their stress level. The focus group data is supported by additional survey data that indicated student workload was perceived by over 43 percent of high school students and 31 percent of middle school students as "too much," while homework load was perceived by 71 percent of high school students and 47 percent of middle school students as "too much" (Figures 13 and 14).

Figure 13: Students Perceptions of Amount of Schoolwork, by School Level (Elementary, Middle, and High)
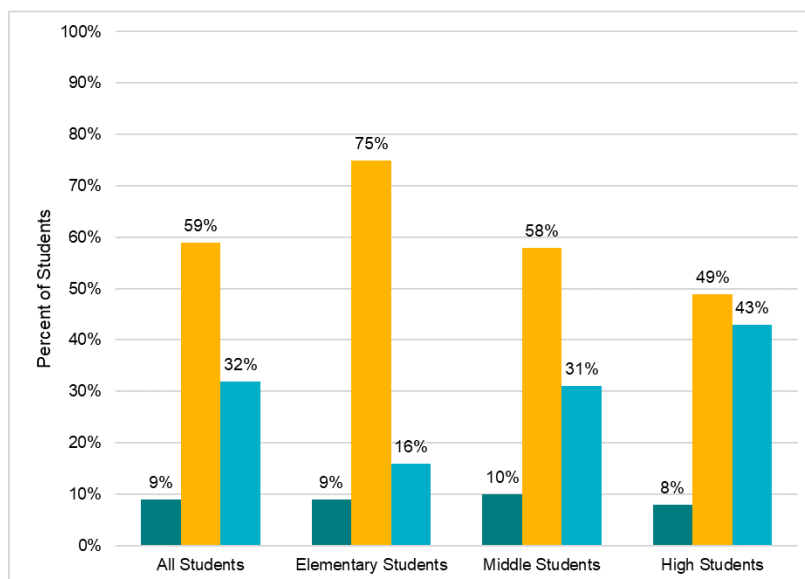
Figure 14: Students Perceptions of Amount of Homework, by School Level (Elementary, Middle, and High)
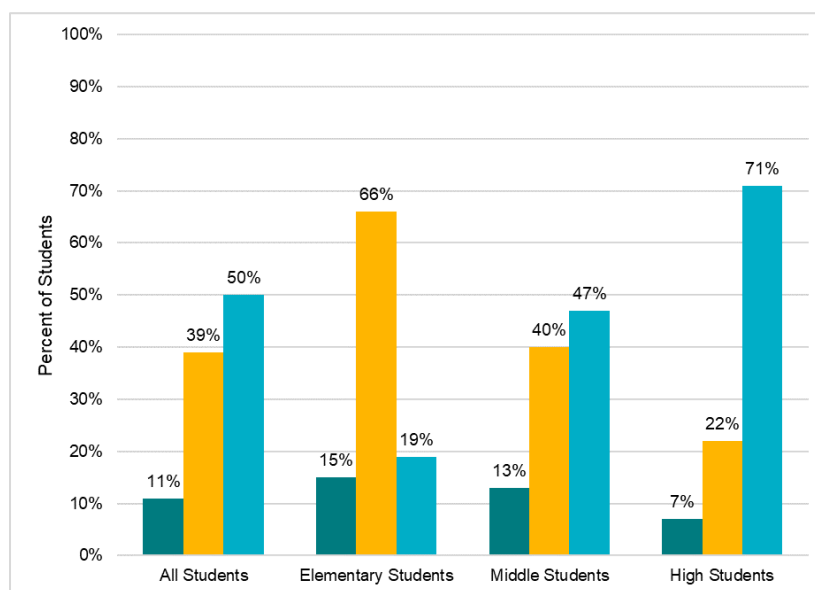
Finding 5: Staff and family perceptions of student engagement overestimated students' own ratings of engagement in teaching and learning.

Student engagement is important to understand as a part of the teaching-learning process. Based on research, student engagement is positively associated with student learning outcomes. For this reason, student engagement was assessed from multiple perspectives. Staff and families rated student engagement between a 4 and 5 on a 5-point scale from 1 (low) to 6 (high). However, students rated their own engagement in teaching in learning at a 4 and lower. In all cases engagement was rated more positively for elementary than middle or high school, with high school students rating their own engagement

lower than any other group (average of 3.5; see Figure 15). Ratings by students at each school level were lower than that of staff and families and the magnitude of the differences categorized as large (*ES*=.60).

Economically disadvantaged students, English learners, and students with disabilities all reported higher levels of engagement than their peers (ES=. 1, .6, and .2, respectively). Parents of English learners and economically disadvantaged students reported higher student engagement than their peers and those differences had a large magnitude (ES=.4 and .3). There were also some racial/ethnic differences with parents of White students reporting lower student engagement than parents of other races/ethnicities at all school levels (ES=.5), although White students did not differ from peers. Asian students reported higher engagement than other students (ES=.1 (v. Black or Hispanic) and .2 (v. White).)

Figure 15: Student Engagement by School Level
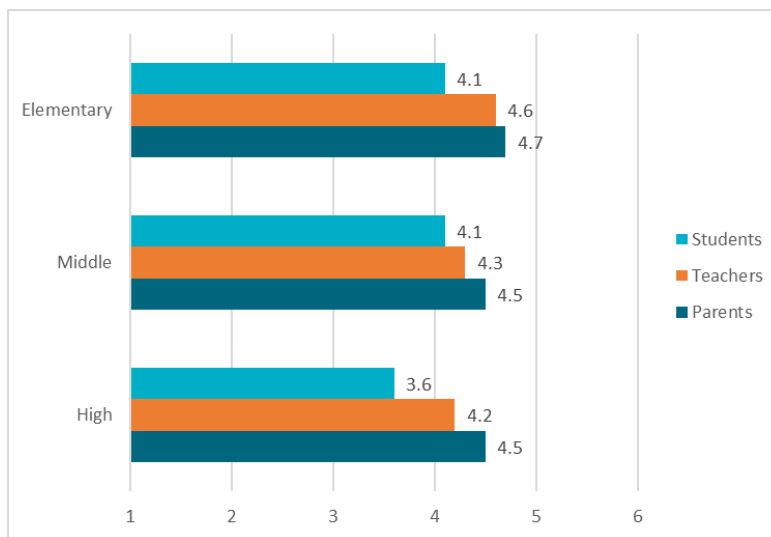
Instruction

This section of the report relied on a review of literature to determine the research-based components of effective virtual instruction and gathered interview data from key central office directors and FCPS documentation to determine the extent to which FCPS' approach to teaching and learning reflected the research-based elements of quality virtual instruction. In addition, this section also relied on surveys and focus groups with teachers, families, and students to determine the extent to which implementation of FCPS' approach to teaching and learning reflected research-based elements.

Research indicated that a set of eight elements were associated with positive outcomes for teaching and learning in a virtual environment. These eight elements, listed in Table 2, include technology, pedagogy, content, design, management, social/communication, willingness to learn, and student self-direction. The first three elements (technology, pedagogy, and content) are typically viewed in an integrated fashion referred to as TPACK, which is an integration of technological, pedagogical, and content knowledge. Additional details on these research-based elements are provided in Appendix D.

Table 2: Description of Research-based Elements for Effective Virtual Instruction

Element	Description
Technology, Pedagogy and Content Integration (TPACK)	Using the most appropriate pedagogical approach to teach content to students, while relying upon the technological tools best matched to the instructional situation (content, pedagogical practice, students)
Design	Development of instructional materials appropriate to use within asynchronous and synchronous environments for the targeted student population.
Management	Management of the virtual classroom in asynchronous and synchronous learning.
Social/Communication	Building of student-teacher, student-student, and family-teacher relationships through ongoing positive communication and social interaction.
Willingness to Learn	Teacher willingness to develop new knowledge and skills for asynchronous and synchronous teaching and learning.
Student Self-Direction	Development of student knowledge and skills that will help them manage their time, learning environment, and ability to monitor and reflect on their own learning.

To what extent were FCPS' school-based and central-based efforts planned and implemented to attain positive outcomes for students (achievement, social-emotional outcomes, equity) during the first half of SY 2020-21?

Summary of Findings
• The majority of families, students, and teachers reported satisfaction with the quality of instruction throughout the first half of SY 2020-21.
• While FCPS' approach to virtual learning in the first half of SY 2020-21 reflected the best practice of incorporating both synchronous and asynchronous instruction, the amount of screen time was perceived to be too great at all school levels.
• FCPS' approach to instruction in the Fall was more closely aligned to the eight research-based elements than last spring, however, expectations around the TPACK (integrated technology, pedagogy, and content) element continue to need more clarity and definition.
• There was a lack of coordination for developing and disseminating instructional resources that reflect TPACK instruction that would meet the needs of all learners, leaving teachers without sufficient supports to design differentiated lessons and assess learning in a virtual environment.
• Staff and parent perceptions of implementation of the research-based TPACK elements were primarily positive. However, student perceptions of the instruction they received were significantly less positive than those of staff or parents.
• Lack of feedback from teachers to students was viewed as having a negative impact on learning.
• Student perceptions of student-teacher relationships were meaningfully lower than perceptions of other stakeholders. However, teachers that made students feel valued and adjusted based on feedback were well received by students and families.
• Most teachers reported that they had the resources needed to teach social-emotional skills but expressed less confidence identifying students in crises.

Finding 6. The majority of families, students, and teachers reported satisfaction with the quality of instruction throughout the first half of SY 2020-21.

Majorities of parents, teachers, and students reported agreement that instructional content is of high-quality (Figure 16). Teachers and students were generally more positive about the quality of instruction, than parents (86, 90, and 75 percent, respectively, agreed the quality of instruction was strong). Elementary parents consistently reported higher levels of satisfaction with the quality of instruction than middle and high school parents (80, 73, 68 percent, respectively).

Figure 16: Parent, Teacher, and Student Satisfaction with Quality of Instruction
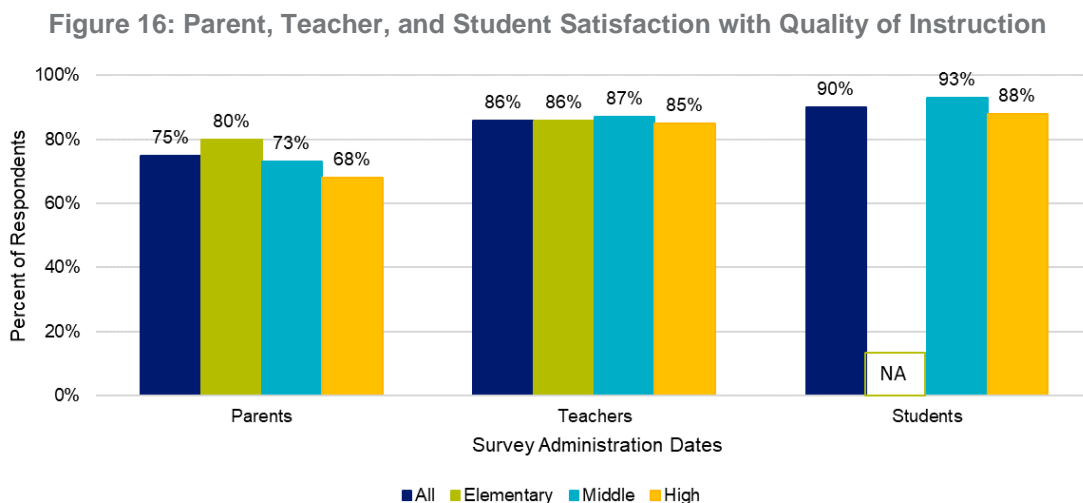
Finding 7: While FCPS' approach to virtual learning in the first half of SY 2020-21 reflected the best practice of incorporating both synchronous and asynchronous instruction, the amount of screen time was perceived to be too great at all school levels.

Last Spring, parents reported concerns that students were receiving instruction primarily through asynchronous instruction. Beginning in Fall 2020, FCPS changed their approach to provide instruction mainly synchronously, following a schedule that mirrored what students would have experienced if they were in physical school buildings. However, data collected about the SY 2020-21 experience indicated that a large percentage of parents at all levels think the amount of screen time is too much (43 percent), matching the percentage who feel it is the right amount (Figure 17). An even greater percentage of students (61 percent) reported too much screen time (Figure 18). Parent and student perceptions of screentime followed the same pattern with screentime at the elementary level viewed more positively than screentime at the high school level. At the elementary level the larges percentages of parents and students viewed screentime as being just right (46 and 56 percent, respectively). At middle school, this was no longer the case as parents were evenly split between perceiving screentime as just right and too much (42 percent), while a majority of middle school students viewed screentime as too much (61 percent). At the high school level, both the largest percentage of both parents and students perceived the amount of screentime to be too much (48 and 76 percent, respectively).

**Figure 17: Parent Perceptions of the Amount of Screentime
by School Level (Elementary, Middle, and High)**
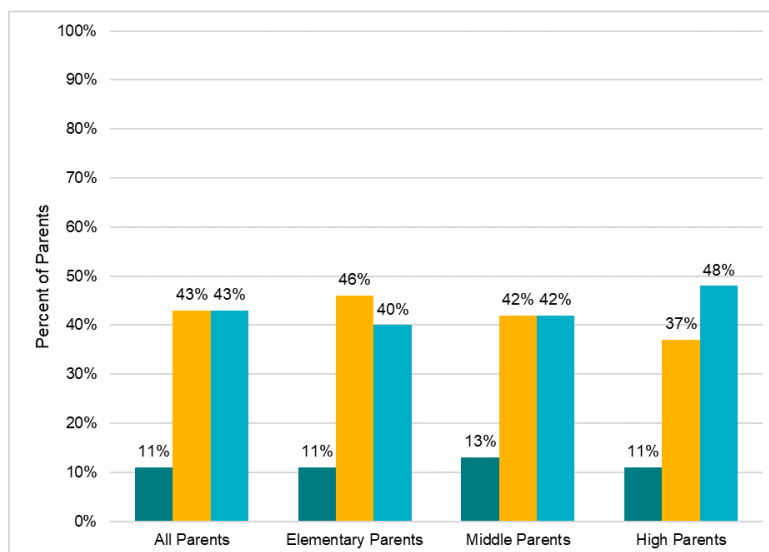
**Figure 18: Student Perceptions of the Amount of Screentime
by School Level (Elementary, Middle, and High)**
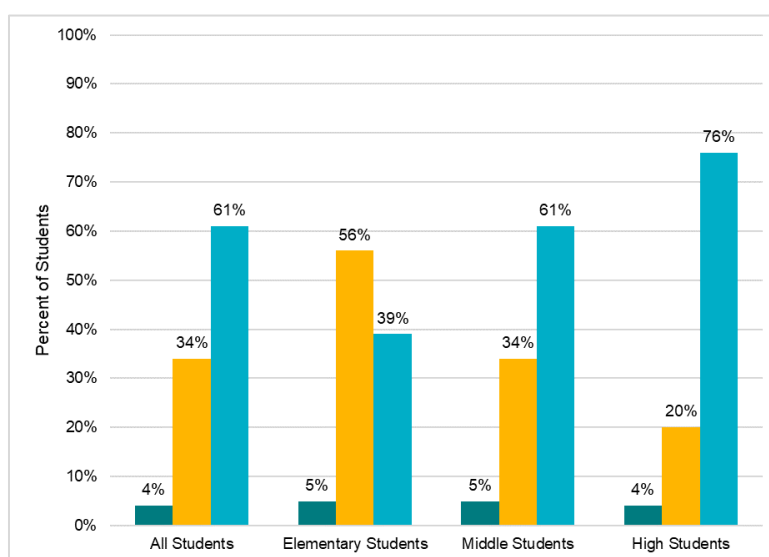
Finding 8: While FCPS' approach to instruction in the Fall was more closely aligned to the eight research-based elements than last spring, expectations around the TPACK element continue to need more clarity and definition.

Following up on its Spring 2020 expectations for virtual learning, FCPS continued to set expectations for instruction that addressed all eight of the research-based elements in some capacity. Specifically, FCPS more clearly outlined roles and responsibilities for teaching and learning in SY 2020-21, provided professional development regarding classroom management strategies in a virtual environment using various technology platforms, and provided support for how to organize the virtual classroom (Table 3). In support of integrating technology with content and pedagogy, FCPS provided more specific guidance on the best technology tools to use in support of specific instructional practices. For management, the division provided professional development and resources to ensure instructional staff could use technology tools

effectively to manage their classrooms. In support of social/communication, FCPS expanded professional development offerings to support how to build positive student-teacher relationships virtually. And finally, in support of student social-emotional learning, FCPS provided resources and professional development to meet the needs of students in this area. Moreover, school schedules were adapted to allocate time regularly throughout the week to check-in with students. At the elementary level, this most often took the form of allocating time for daily morning meetings. At the secondary level, this took the form of a synchronous learning seminar class during the week and a check-in on asynchronous days.

Table 3: Alignment of Approach to Research-based Elements

Element	February 2021 Status	Addressed	Missing
TPACK	Somewhat Addressed	The Google site with multiple interconnected instructional technology resources (called the digital ecosystem) showed instructional staff what technology tools were most appropriate to use with specific instructional practices within the teaching/learning cycle.	Inconsistent integration of all three elements for all school levels and content areas (see Findings 8-12).
Design	Somewhat Addressed	Some centrally and collaboratively designed synchronous and asynchronous instructional materials available	Few if any courses were designed centrally beyond the planning and pacing guides. Therefore, the majority of courses were designed by individual staff in each school (see Finding 9)
Management	Somewhat Addressed	Provided advice for handling classroom management in an online environment Provided support in how to organize a virtual or concurrent classroom Outlined roles and responsibilities of staff during learning Provided families with tips for creating a good learning environment at home Included digital citizenship	The Division did not communicate how to balance management with building positive student/teacher relationships virtually (see Finding 13).
Social/ Communication	Fully Addressed	Prompt communication with students and families stressed. Outreach expected to non-participating students and families. Teachers were expected to build positive student/teacher relationships virtually.	*See Finding 13 about related concerns about the intersection between the elements of social/communication and management.*
Teacher Willingness to Learn	Fully Addressed	Communicated that all staff be willing to learn how to best implement the approach to virtual learning. Expected staff to participate in staff meetings, collaborative team meetings, and professional development .	None
Student self-direction	Somewhat Addressed	Communicated that students should establish a daily routine and physical space for learning in their home. Self-direction support for some populations (e.g. Special Education) provided.	Self-direction guidance for all students not in place (i.e., time management and planning, monitoring, and reflecting on learning).

While FCPS developed professional development and resources that connected technology with pedagogy, integration of these two elements with content was not observed or communicated as expectations for staff at all school levels and content areas. Each grade level and content area had streamlined curriculum and planning and pacing guides. The majority had some examples of a few units that could be adapted for use by teachers. However, there was no explanation of how the unit was designed to reflect the teaching of content through best instructional practices while making choices regarding the best instructional tools to use to do so. This information could have served to provide teachers with underlying principals or approaches to follow when designing their own virtual lesson plans.

The Google site with multiple interconnected instructional technology resourced (call the Digital Eco-system) provided examples for the selection of technology tools matched to instructional practices. However, it did not provide expectations, detailed descriptions, or exemplars of high-quality instructional

resources for how to integrate pedagogy and technology into content. It relied upon teachers' knowledge of properly identifying instructional best practices (pedagogy) to content and then selecting the appropriate technology and integrating it into instruction. This lack of definition likely contributed to teacher challenges described by focus group participants and their desire to have exemplars to guide their practice virtually and with quality. During focus groups with teachers, one of the major challenges reported was not having high-quality exemplars of lessons to teach content. This was mentioned for grade level/class content as well as for teaching social-emotional learning. This theme emerged in all teacher focus groups and was discussed by a majority of teacher focus group participants (53 percent, n=51). Examples of teacher concerns captured in the teacher focus groups included:

> 'Application and exploration of concepts is missing for various content areas (e.g., can't do labs online). Don't know how to synchronously teach some content.'

> 'No support to mesh content with pedagogy with tech/inconsistent across classrooms (challenge for kids and teachers).'

> 'Difficulty in creating viable assessments to understand knowledge.'

Finding 9: There was a lack of coordination for developing and disseminating instructional resources that reflect TPACK instruction that would meet the needs of all learners, leaving teachers without sufficient supports to design differentiated lessons and assess learning in a virtual environment.

To understand central supports for high-quality teaching and learning, including any Division expectations, central office directors were invited to provide input through electronic interviews. These directors spanned the scope of teachers providing instruction for varied student groups (General Education, Special Education, and English learners) as well as those units that provide professional development and support to schools in general and specifically regarding equity.

Based on the interviews, there appeared to be a common focus on the instructional cycle (Plan, Teach, Assess, Reflect – called the [FCPS Learning Model](#)) and a framework that unpacks characteristics of the instructional cycle (called the Instructional Framework) coming from some central offices. In particular, there was a heavy focus on streamlined curriculum, revised planning and pacing guides, and instructional resources. This work was led by staff in the PreK-12 Curriculum and Instruction office in the Instructional Services Department and the Elementary and Secondary School Support offices in the Department of School Improvement and Supports, with strong focus and coordination around instruction for the general education student. FCPS developed Google sites as the primary access point for this work. The ESOL and Special Education Instruction offices added their efforts within the sites organized by grade level and content area. Resources and supports to address equity and professional development were provided by the Office of Professional Learning and Family Engagement. Social Emotional Learning and mental health and wellness resources and supports were provided by many within the Department of Special Services. However, these other resources were not integrated with those academic resources for staff.

Within the Google sites for teachers, teaching considerations were offered regarding support for special populations of students such as English learners, students with disabilities, and advanced learners. However, this work was content neutral and provided guidance on instructional needs of these student groups rather than setting expectations for how to match instructional best practices and technology to best convey differentiated content to these student groups. These teaching considerations were not integrated into the exemplar units provided for general education instruction. Therefore, there were no complete models for instruction that integrated technology and used best practices that modeled differentiation to meet the needs of various learners across core content and social-emotional learning. The available resources also did not provide explanations to teachers about why the decisions were made such that teachers could understand the underlying principles they should follow when developing their own lesson plans. This left many teachers, who were not experts in virtual instruction, with the difficult task of needing

to design instruction that would differentiate sufficiently well and integrate TPACK within the virtual environment without clear guidance on how to do these things.

Finding 10: Staff and parent perceptions of implementation of the research-based TPACK elements were primarily positive. However, student perceptions of the instruction they received were significantly less positive than those of staff or parents.

Staff, parents, and students were surveyed regarding their perceptions of the extent to which technology was well integrated with pedagogy and content and the extent to which teacher's assessed student learning. In general, staff reported moderately high levels of implementation for each area (average scale scores of 4.9 on a 6-point scale; Figure 19). However, parent and student perspectives of general instruction and integration of technology were lower and the magnitude of the difference was large (ES=.8).

Teacher perceptions of assessment and feedback were also higher than all other groups (4.9 vs 4.5) and the magnitude of that difference was also categorized as large (ES=.5). While teachers rated Assessment highly, approximately one quarter of teachers in focus groups reported challenges assessing students virtually (28 percent, n=51). Specifically, teachers expressed challenges doing quick checks of student learning and providing feedback and challenges creating what they perceived as valid assessments.

Figure 19: Perceptions of TPACK Implementation
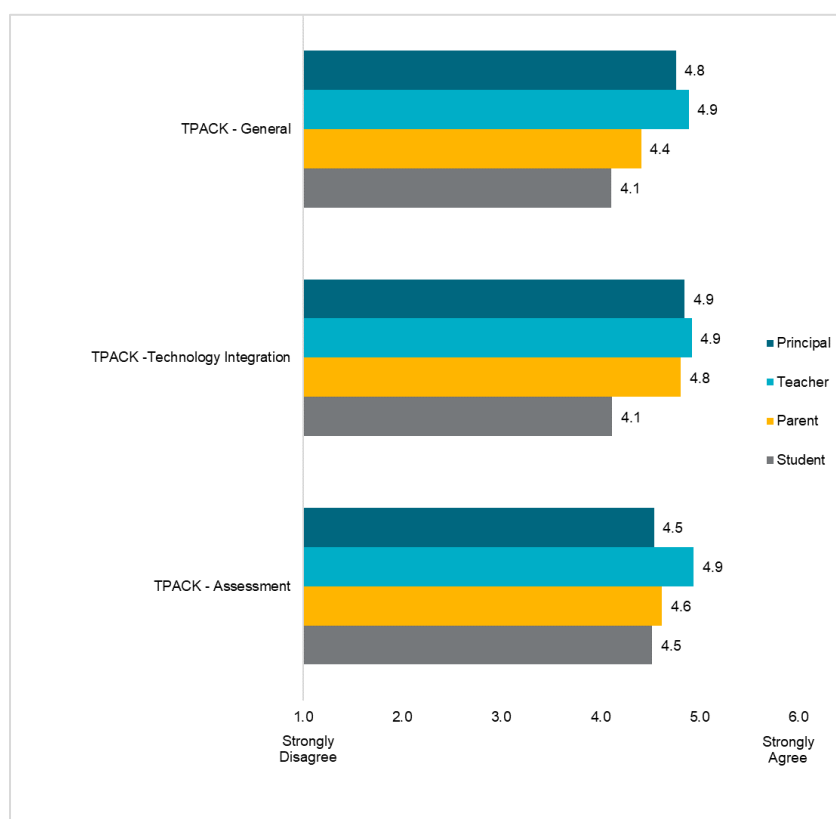
Approximately one-half of teachers (49 percent, n=51) in focus groups reported feeling competent in engaging students in synchronous instruction. Moreover, two thirds of teachers (69 percent, n=51) reported capability in supporting student self-direction in their own learning. The following exemplars of comments help illustrate their discussions during the focus groups:

> "Private chats have been helpful for those who might need extra support."

> "Use of break out rooms as a social choice time has made a difference in students risk taking and engagement in learning."

"Advisory period has been where students have opportunity to learn self-management skills and work on well-being."

However, parents and students did not have similarly positive perceptions of teacher's TPACK instruction as described in their own focus groups. Some parents (30 percent, n=46) and a majority of middle and high school students (53 percent, n=38) reported instruction that did not reflect the TPACK element needed for high quality instruction. They reported instruction that was composed of students viewing GoogleSlides, with their cameras turned off and little interaction between teachers and students. The following exemplars of comments help illustrate this theme that arose during discussions:

"The best teachers were those that used technology to engage us in the learning. Sometimes it was just a conversation, sometimes it was Pear Deck. The worst was when teachers had an over-reliance on GoogleSlides. Then we had to spend a ton of time outside of class watching videos to learn the things we should have learned in class. It was like some teachers dominated technology and others were dominated by technology."

"Assignments are given, but there is no rich opportunity to truly interact with the content."

"There is a lack of differentiation where teachers are not able to adjust to students' needs."

"Too much lecturing and PowerPoint that are not engaging."

Finding 11: Lack of feedback from teachers to students was viewed as having a negative impact on learning.

In addition to the quantitative information gathered on assessments from students, assessment and feedback emerged as a strong theme among the qualitative information gathered as a part of this study. When asked about feedback they receive to support their learning, the majority (55 percent, n=38) of middle and high school students in focus groups reported limited feedback. Many reported significant delays in assessments of learning through quizzes and tests. Moreover, these students often reported limited access to teachers to ask clarifying questions during synchronous instruction because microphones and chats were turned off. Students that asked clarifying questions through email often found that teachers did not promptly respond to emails. Many students reported that this impacted their learning, including the following that reflected this theme:

"Feedback was lacking at times and was often related to grading delays, causing misleading understanding or false mastery."

"Students need more opportunities to get immediate feedback on assignments or practice opportunities on work."

Finding 12: Student perceptions of student-teacher relationships were meaningfully lower than perceptions of other stakeholders. However, teachers that made students feel valued and adjusted based on feedback were well received by students and families.

Figure 20 shows the average perceptions of student/teacher relationships from the perspectives of several stakeholders. Staff and parent data indicated positive perceptions of the efforts teachers made to form positive and caring relationships with students. However, students' perceptions of teacher efforts were less positive than all other stakeholders and the magnitude of those differences was large (*ES*=.50 and greater).

Figure 20: Perceptions of Student/Teacher Relationships
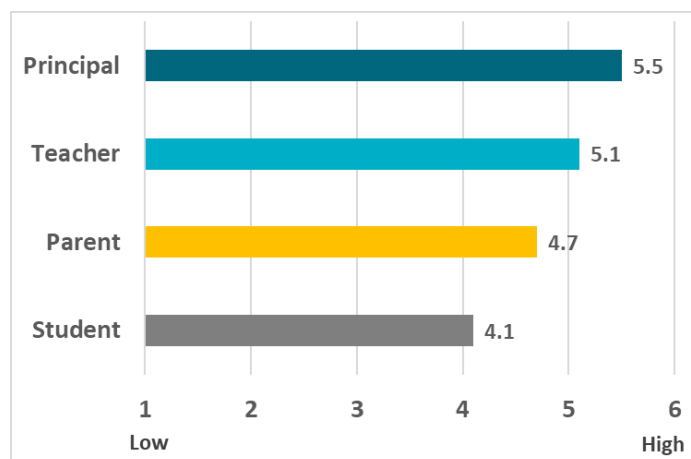
In addition to survey data, middle and high school students expressed concerns about teachers' respect for students and efforts to form positive relationships that would benefit the teaching and learning process. This manifested itself in student statements that teachers regularly turned off microphones and chats limiting any form of interaction, as well as that teachers did not engage in any conversation to get to know their students or interact with them about non-academic topics. However, teachers that made the effort were recognized and respected by students.

> "Some of my teachers really respected student voice. What I said mattered. Those teachers figured out how to share their power with their students without having to give up all of their power in the classroom. They didn't have to shut off microphones and chat to teach us. Teachers need to create a culture in the classroom, think about the respect they show and power they give students."

> "Teachers turning off our microphone and chats to make sure we don't talk just doesn't help. We get it, you don't respect us or trust us to behave."

> "Teachers not responding to students to address understanding of concepts-delay means student shuts down."

> "It works when it is not awkward to ask questions and feeling included just like you do in school."

> "I've loved when students/teachers share their pets on screen. Bonding experience at the start of class."

Finding 13: Most teachers reported that they had the resources needed to teach social-emotional skills but expressed less confidence identifying students in crises.

The large majority of teachers overall and at all school levels indicated they had the resources to address the division priority for students, social-emotional skills. The level of agreement for high school teachers was consistently lower than that for elementary and middle school teachers. Some teachers in focus groups expanded on challenges addressing students' social-emotional needs in the following ways:

> 'Wish that FCPS would have created social-emotional lessons centrally so it wouldn't contribute to teachers' workload.'

> 'It has been hard to balance focusing on the learning and wellness for kids. No great models for how to do that in the time we have with our kids.'

Figure 21. Teacher Agreement on SEL Resources and Identification of Student Needs
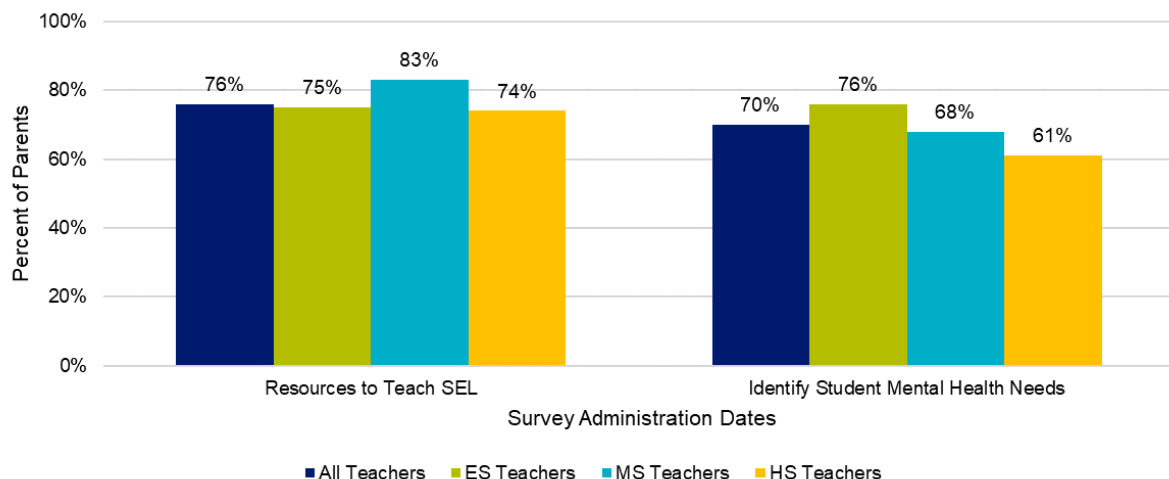
A similar pattern was observed for capability to identify students with intensive mental health and wellness needs. Again, high school teachers' agreement was consistently at least 10 percentage points lower than other teachers. This may be reflective of high school students' reported stress levels and lower level of engagement in teaching and learning (Figure 21).

Relation between Instruction and Student Outcomes

As done in Report 1 in Spring 2020, the study sought to understand the relation between the research-based elements, student engagement, and student outcomes. To do so, regression analyses were conducted controlling for any differences that were associated with student demographic characteristics.

To what extent was stronger instruction with the eight research-based elements tied to better student outcomes?

Summary of Findings
• Student-teacher relationships and respect for student voice were essential elements for students to meaningfully engage in classroom learning.
• Students' engagement and outcomes were positively affected when the research-based elements were addressed.

Finding 14: How teachers help students learn self-direction skills, and how teachers communicate and integrate technology in class have positive effects on student's engagement levels.

Once implementation of the research-based elements within instruction was understood, the study sought to understand the relation between these elements and student outcomes. Regression analyses showed that integration of technology, student/teacher relationships, and support for student self-direction all had a positive impact on student engagement in virtual instruction. As a group, implementation of the research-based elements explained student engagement (R^2 =.59, p<.00). The analyses indicated that learning environments with greater integration of technology, more positive student/teacher relationships, and greater support for student self-direction resulted in students reporting higher levels of engagement with their schoolwork. Teachers' implementation of classroom management had no relation with student engagement at the elementary or middle/high school level. This would indicate that teacher efforts could be more impactful focusing on elements other than control of students' microphones or chat ability (Table 4).

Table 4: Association of Research-Based Elements on Student Engagement

Element	Magnitude of Effect on Elementary Student Engagement	Magnitude of Effect on Secondary Student Engagement
TPACK	Small+	Small+
Management	None	None
Student/Teacher Relationships	Small+	Small+
Student Self Direction	Small+	Small+

Finding 15: Strong implementation of TPACK, positive student/teacher relationships, and strong student engagement were positively associated with student performance.

Once the relation between research-based elements to student engagement was established, the study sought to understand the relation of these elements to student performance. Regression analyses indicated that the relation between TPACK-based instruction, technology integration and assessment as well as student/teacher relationships and student engagement were positively associated with student performance in English and mathematics (Table 5). Together, implementation of the Learning Model and student engagement explained student outcomes as observed by teachers and families with explanatory value ranging from 12 to 36 percent depending on the outcome measure (English $R^2 = .12$, Math $R^2 = .14$, Social-Emotional Wellness $R^2 = .36$). Management and Student Self-Regulation had no relation to student marks. In addition, equity in technology was positively associated with student marks. These same elements also had a small positive relation with student social emotional wellness. The relation between the variables in Tables 4 and 5 are displayed graphically in Figure 22.

Table 5: Association of Research-Based Elements on Student Marks

Element	Magnitude of Effect on English Marks	Magnitude of Effect on Math Marks	Magnitude of Effect on Social Emotional Wellness
TPACK	Small+	Small+	Small+
Management	None	None	Small+
Student/Teacher Relationships	Small+	Small+	Small+
Student Self Direction	None	None	Small+
Equity in Technology	Small+	Small+	None
Student Engagement	Small+	Small+	Small+

Figure 22. Model of Relations Between Variables
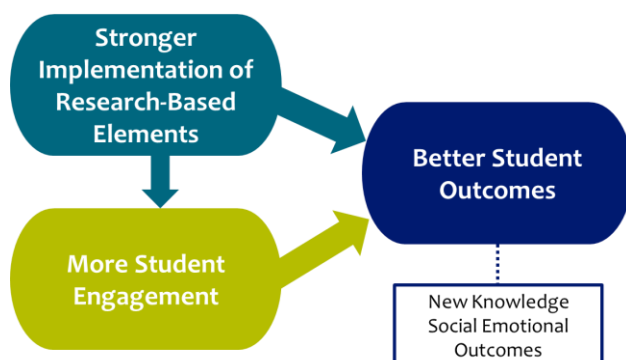
Conclusions

With the additional time available to FCPS since the COVID-19 pandemic began, the Division was able to more fully develop resources and prepare staff for effective virtual instruction and support for students' social-emotional needs during the 2020-21 school year than it had been able to stand up at the end of the prior year. As it became apparent toward the end of last school year that many (and eventually all) FCPS students would continue to learn virtually during the current school year, FCPS set out to improve both the resources and supports that were available for effective virtual instruction. These included providing more synchronous instruction than had been available in Spring 2020, setting higher expectations for the expected quality of virtual instruction, establishing an enhanced focus on student well-being and social emotional learning, as well as providing professional development and instructional resources to support students' academic and well-being needs.

As the year progressed, FCPS students appear to be attaining better academic outcomes, likely signaling greater adaptation of staff, students, and families to the virtual learning context. While the November 2020 report on middle and high school marks for first quarter caused grave concern about how FCPS' students were doing in virtual instruction, data available since then have shown a more optimistic picture of student's academic performance. Quarter 2 marks for middle and high school students generally demonstrate better performance than in the first quarter and, at times, better performance than in the second quarter of prior school years. Additionally, marks for elementary students, which was not covered in the November marks reporting, demonstrated the same pattern of improvement in the second quarter. This points to the likelihood that staff, students, and families are adapting and finding ways to make virtual instruction a success. The improvements that have been found may also reflect the changes that FCPS has adopted since the November report came out, such as in grading and number of assignments.

Recent student performance data does not reflect learning loss for most students, though English learners have demonstrated less success in the virtual environment and will need greater supports moving forward to improve outcomes. When schools closed last Spring at the start of the pandemic, there was considerable concern both nationally and internationally, that students would suffer from learning loss. In other words, the abrupt shift to virtual instruction was considered a likely impediment to student learning and potential exacerbation of achievement gaps. These concerns were reified by the November marks report's statements about rising failure rates, especially among student groups seen as most vulnerable (e.g., students with disabilities). The more recent academic performance results reported on in this report indicate that for most students, learning loss does not seem to be an issue. So while performance gaps continue to exist, with one exception, they appear not to have been exacerbated by the switch to virtual instruction. The one exception, however, is an important one to focus upon as both the Spring 2020 report and this current one have found English learner students to be negatively impacted. And, while English learners were some of the first students to be returned to in-person instruction, not all have families who have chosen the in-person mode of instruction for their child, meaning the challenge of providing effective instruction to English learners to support their academic success in a virtual environment will continue.

FCPS' ability to meet the needs of students who are experiencing academic challenges, such as many of our English learner students, will be limited unless the Division attends to staffs' capacity to accurately assess learning. To meet the needs of English learner students and others experiencing academic challenges requires that teachers be well-versed in assessment to identify what has or has not been learned by the student. Unfortunately, as described in the findings, teachers and students continue to report concerns about assessment in a virtual environment. So while improvement has occurred since last Spring when little to no assessment was happening during virtual instruction, improvement in teachers' capacity to assess student learning remains an area that teachers are requesting be better supported through professional development and instructional resources. In addition to using assessment information to inform learning, students rely upon teacher feedback to gauge their own learning, so both aspects of assessment should be attended to.

The professional development focused on student's social-emotional learning received by teachers at the start of this school year and related supports implemented by schools have not been able to counter the stress students are experiencing. The COVID-19 pandemic is stressful for everyone. For this reason, FCPS has focused on providing additional supports beyond what was available to students before the pandemic to support student well-being. Additionally, FCPS has taken steps to reduce workloads

and pressures by decreasing the number of required graded assignments per quarter and adding enhanced flexibility to grading. Even so, the information reported here and in the Check-In Survey reporting indicate that student feeling of high stress remain common. Perhaps the pandemic itself is the root cause and FCPS cannot do much to ameliorate it but certainly ensuring that FCPS is not adding to other burdens is important.

While most students are performing relatively well academically, FCPS should be concerned about student engagement during learning within a virtual environment, especially given that approximately 50 percent of students will continue to learn virtually throughout this year. Students more so than others continue to describe much of the instruction they receive, particularly at the high school level, as not engaging. This indicates that the professional development that was available to staff prior to the beginning of this school year to support development of engaging lessons has not shifted the practices of many teachers sufficiently for students to feel engaged in virtual learning. This is likely not surprising given the requests coming from teachers to help them improve instruction but is still worrisome given that student engagement is tied both in outside research and in this study to higher achievement.

Weakened student-teacher relationships may have long-lasting impacts if a better balance between virtual classroom management and social/communication factors is not achieved. The middle and high school students that participated in focus groups, as well as some who provided open-ended comments to survey questions, were quite vocal in expressing the difficult student-teacher relationships that had been created by classroom management techniques that made them feel that their voices were not important. This likely contributed to some of their low ratings of engagement in their schoolwork, which is worrisome. The long term impact of what students have experienced may be more important if it impacts their overall relationship with schooling in a way that causes them to associate schooling with negative feelings and lack of belonging.

With approximately 50 percent of students continuing to learn virtually, equity in instruction will continue to be an issue without high-quality exemplars of virtual instruction that reflects TPACK across the content areas, school levels, and for groups of students with unique learning needs. As explained in this report and the report released last Spring, effective virtual instruction is different from effective in-person instruction. It requires different competencies from both teachers and students than those needed when learning occurs in-person. Having now taught primarily in a virtual mode for almost a year, teachers appear to be getting more used to it and, potentially, becoming more efficient and effective at it. Nonetheless, as described in the findings in this report, the need to continue to develop TPACK competencies in staff throughout the Division, and the scarcity of truly integrated lessons to support understanding of strong teaching, assessing, and differentiating remain a concern. With approximately half of all students continuing to learn virtually through the remainder of this year and potentially into the next, FCPS will need to continue to invest in developing virtual instruction skills in many teachers and address the outstanding concerns about what effective virtual instruction is.

Recommendations

1. Continue to develop the understanding of school- and central-based staff involved in virtual or concurrent instruction with an understanding of principles behind effective virtual instruction that reflect the eight research based elements, especially the integration of technology, pedagogy, and content that yields engaged learners.

2. Develop a framework to guide teachers through the decision-making process needed to plan virtual academic and social-emotional learning lessons that guides them in matching pedagogy to content and the integration of technology, including equitable delivery of differentiated content to diverse learners.

3. Enhance supports for basic needs, well-being, and academics for any student struggling in these areas, focusing, in particular, on English learner students.

4. Adjust guidance on classroom management to ensure it does not overpower building positive student-teacher relationships.

5. Ensure teachers have sufficient capacity to assess their students both formatively and summatively within a virtual environment and to provide timely feedback to students that supports

their learning.

6. Address student workload issues to decrease student stress, whether students are in-person or virtual.

APPENDIX A

DESIGN CHART

Project Title:	Study of Teaching and Learning During the COVID Pandemic
Projected Start Date:	Spring 2020
Projected Completion:	Fall 2022
Expected Deliverables:	Interim Report #1 (July 2020) Interim Report #2 (February 2021) Final Report (Fall 2022)
ORSI Evaluator(s):	Janine Lacina (Lead), Chantal Follett (Support), Sammi Karalaus (Support), Alisa Pappas (Support),
Advisory Team Members:	• Jugnu Agrawal, Specialist Adapted Curriculum • Maria Genova, School Psychologist Supervisor • Ken Halla, Coordinator eLearning • Alicia Hunter, Specialist Equity & Cultural Responsiveness • Noel Klimenko, Director PreK-12 Curriculum and Instruction • Jennifer Lempp (PK-G6), Director School Support • Ray Lonnett, Region 1 Executive Principal	• Evangeline Petrich, Region 3 Executive Principal • Richard Pollio, Director ESOL Services • Claire Silva, Project Support Coach • Karin Williams, Director ISD Operations and Strategic Planning • Yubo Zhang, Manager Test Analysis & Adminstration • Diane Cooper-Gould, Fairfax County SEPTA member • Jenna White, FCCPTA member
Source of Study Request:	Division Superintendent
Background/History:	With the sudden shutdown of schools in March 2020 due to COVID-19, FCPS was forced to transition to DL, which was intentionally designed with attention to equity concerns so all students could access opportunities to learn while not receiving the structures and scaffolds of traditional in-school instruction. The degree to which students accessed learning opportunities and benefitted academically or social-emotionally from DL is unclear. Moving into the 2020-21 school year, given current health recommendations from the CDC and local health officials, FCPS is offering full-time DL for all students. At the behest of the School Board, FCPS has identified phases upon which students will be allowed to return to school. Even when schools reopen, CDC guidance maintains that physical distancing is required meaning that DL will continue in some form for all students. This study will examine how FCPS' DL compares to best practices gleaned from research, investigate implementation of best practices, look at the extent to which DL has helped meet academic and social-emotional needs, and consider DL costs. The study will support FCPS' understanding of what worked and what requires adjustments in their DL model for continued use of DL when needed.
Purpose of Study:	This study seeks to determine the impact virtual instruction has had on student academic and social-emotional outcomes. It is intended to focus on spring 2020 DL, as well as any continued use of distance learning (DL) in SY 2020-21. The study will allow FCPS to judge the effectiveness of DL in keeping students academically on track and supporting their social-emotional needs, including DL with special populations such as students with disabilities, English learners, students participating in advanced academic programs, and economically disadvantaged students. The results of the study can be used by FCPS leadership and departments to plan any needed future DL as well as by the School Board to address any policy or funding implications.

II. STUDY DESIGN

Evaluation Questions*	Data Source	Data Collection Method	Data Collection Timeline	Data Analysis	Reporting Timeline
A. Design					
1. To what extent was virtual teaching and learning designed to address: a. student achievement needs? b. social-emotional needs? c. equity concerns? d. other needs (e.g., food, school supplies)? *Spring 2020 data collection*	Research articles Communications from FCPS Department/Office documents (i.e. Blackboard 24-7, FCPS website, etc.) School-Based Technology Specialists (SBTS) and Instructional Coaches (IC)	Literature review Document Review Focus Groups	June-July 2020	Document analysis Content Analysis	Interim Report #1 (July 2020)
Fall 2020 data collection	Research articles of best practices, specifically for K-12 focusing around framework for TPACK and Learning Model; and eight elements divisions should address for effective virtual instruction Communications from FCPS Department/Office documents (i.e. Teacher, principal, and parent google sites, Return to School (RTS) website, etc.) Professional Development sessions (MyPDE) Directors in the Instructional Services Department (ISD), Department of Information Technology (DIT), Department of Student Services (DSS), Office of Professional Learning and Family Engagement (OPLFE), Office of Student Support (OSS)	Expanded literature review Document Review Observation Form Interviews	Mid-August 2020– Early January 2021	Document Analysis Content Analysis	Interim Report #2 (February 2021)

Evaluation Questions*	Data Source	Data Collection Method	Data Collection Timeline	Data Analysis	Reporting Timeline
Spring 2021 data collection	Communications from FCPS Department/Office documents (i.e. Teacher, principal, and parent google sites, RTS website, etc.) Professional Development sessions (MyPDE) RAS Directors in ISD,DIT,OPLFE,OSS, DSS	Document Review Observation Form Interviews	April – June 2021	Document Analysis Content Analysis	Final Report (Oct 2021)

A.	Implementation				
2a. To what extent was virtual instruction implemented as expected by Central Office? *Over the course of the study, this question will be examined for implementation the Spring 2020 virtual instruction period, as well as during school year 2020-21.* *Spring 2020 data collection*	Not collected	Not collected	Not collected	Not collected	Not reported
Evaluation Questions*	**Data Source**	**Data Collection Method**	**Data Collection Timeline**	**Data Analysis**	**Reporting Timeline**
Fall 2020 data collection	Teachers School-based mental health staff/DSS Principals ISD, OPLFE, DIT, CCR, OSS	Surveys Interviews	Early September 2020 – Early January 2021	Quantitative Analysis Content Analysis	Interim Report #2 (February 2021)
Spring 2021 data collection	Students Parents Teachers School-based mental health staff/DSS Principals Teachers Principals RAS ISD, OPLFE, DIT, CCR, OSS	Surveys Focus Groups*a deeper dive than the survey on fewer implementation-related questions. Interviews	April – June 2021	Quantitative Analysis Content Analysis	Final Report (Oct 2021)

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Evaluation Questions*	Data Source	Data Collection Method	Data Collection Timeline	Data Analysis	Reporting Timeline
2b. To what extent was DL implemented as expected by schools and instructional staff? *Over the course of the study, this question will be examined for implementation the Spring 2020 DL period, as well as during school year 2020-21.* *Spring 2020 Distance Learning Study*	Parents Teachers Principals RAS SBTS IC	Surveys Interviews Focus Groups	June – July 2020	Quantitative Analysis Content Analysis	Interim Report #1 (July 2020)
Evaluation Questions*	**Data Source**	**Data Collection Method**	**Data Collection Timeline**	**Data Analysis**	**Reporting Timeline**
Fall 2020 data collection	Students Parents Teachers Principals School-based mental health staff /Directors Student Services Teachers Central Office #/type of assessments administered	Surveys Focus Groups *a deeper dive than the survey on fewer implementation-related questions.* Interviews Data request	Mid-August 2020– Early January 2021	Quantitative Analysis Content Analysis	Interim Report #2 (February 2021)

*Spring 2021 data collection	Parents Students Teachers School-based Mental Health staff/Directors Student Services Principals	Surveys	April – June 2021	Quantitative Analysis	Final Report (Oct 2021)
	Students Parents Teachers School-based Mental Health staff/Directors Student Services Principals	Focus Groups *a deeper dive than the survey on fewer implementation-related questions.*		Content Analysis	
	Central Office	Interviews			
	#/type of assessments administered	Data request			

	B.	Outcomes			

3. To what extent did Teaching and Learning
 	
  a. Engage students?
  b. meet learning outcomes for students?
  c. mitigate learning loss for students?
  d. minimize negative social-emotional outcomes for students?
  e. meet other needs (e.g., food, school supplies) for students?
When possible, students attending all virtual instruction will be compared to students attending in-school instruction.
 	
*Spring 2020 data collection
	Parents
	Teachers
	
	SBTS
	IC
		Surveys
		
		Focus Groups
			June – July 2020	Quantitative Analysis
				
				Content Analysis
					Interim Report #1 (July 2020)

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Evaluation Questions*	Data Source	Data Collection Method	Data Collection Timeline	Data Analysis	Reporting Timeline
*Fall 2020 data collection	Assessment Data for SYs 2017-18 through SY 2020-21	• iReady (grades 1-6 reading and 2-6 math) • 1st quarter marks (1-12) • Reading and math Inventory data	Early September – early November	Quantitative Analysis	Interim Report #2 (1/29/21)
	Students Parents Teachers School-based Mental Health staff/Directors Student Services Principals	Surveys			
	Students Parents Teachers Principals *contextual descriptives; not for analysis	Focus Groups		Content Analysis	

Evaluation Questions*	Data Source	Data Collection Method	Data Collection Timeline	Data Analysis	Reporting Timeline
Spring 2021 data collection	Assessment Data for SYs 2017-18 through SY 2020-21	• Formative assessment data (iReady 1-6, possibly Horizon 3-8) • Summative assessment data (SOL, AP/IB tests, SAT, etc.) • Quarterly and final Marks	April – June 2021	Quantitative Analysis	Final Report (Oct 2021)
	Students Parents Teachers School-based mental health staff/Directors Student Services Principals	Surveys			
	Students Parents Teachers Principals *contextual descriptives; not for analysis*	Focus Groups		Content Analysis	

			C. Costs		
Evaluation Questions*	**Data Source**	**Data Collection Method**	**Data Collection Timeline**	**Data Analysis**	**Reporting Timeline**
4. How did the cost of Teaching and Learning compare to traditional school operations? *Spring 2020 data collection*	Not collected	Not collected	Not collected	Not collected	Not reported
Spring 2021 data collection	Cost data Directors in OSS, FS, DSS, DIT, OPLFE	Data requests Interviews	April – June 2021	Cost Analysis Content analysis	Final Report (Fall 2022)

APPENDIX B

METHODOLOGY

Appendix Overview

The Teaching and Learning during the COVID Pandemic study used a variety of qualitative and quantitative data to inform the findings and conclusions for the second interim report. Qualitative data included: (1) document review to gather information on expectations and implementation of virtual learning for SY 2020-21; (2) interviews with directors to provide additional information about how virtual instruction was designed and implemented; and focus groups, conducted in December and January, provided information about the implementation and effectiveness of virtual instruction and supports from the perspective of students, parents, and teachers. Quantitative data about implementation and outcomes of virtual instruction was collected through surveys of students, parents, and staff. FCPS achievement data were also collected. This appendix describes what data was collected, how and from whom it was collected, and the analysis procedures.

Document Review

Data Collection

A variety of sources were examined to understand expectations set by the Division for schools and instruction, alignment to research-based practices and other concerns related to virtual instruction, including the following:

- The FCPS Distance Learning Plan and presentations to the School Board
- Professional development sessions for teachers prior to the start of the SY 2020-21
- The FCPS COVID-19 website, including pages on Distance Learning and Return to School
- The Distance Learning Support module in Blackboard 24-7
- Distance Learning resources shared through Google Drive
- Communications to parents and staff (Superintendent emails, Infograms and Actiongrams, Special Education Newsletter)

Content analysis was used to document how FCPS designed virtual instruction for SY 2020-21, the supports in place to communicate expectations to families and staff, and to support staff implementation. Specifically, ORSI staff reviewed the Distance learning plan and FCPS Learning Model to document expectations for the structure of virtual learning and expected activities by central office and school-based staff. Examination of the professional development sessions provided information on the extent to which offering matched the areas identified in the literature as critical for successful virtual instruction. ORSI staff also reviewed the virtual instruction support modules in Blackboard 24-7 and Google Drive to understand the amount and level of guidance provided to teachers on use of different platforms and programs, curricular resources, and other supports for implementing virtual instruction. Finally, communications to parents and staff were examined for additional information related to supports and guidance for virtual instruction.

Interviews

Data Collection

Virtual interviews were conducted with directors in the following departments/offices: Instructional Services Department, Department of Special Services, the Office of Professional learning and Family Engagement and the Office of School Support. The responses to the open-ended questions, as well as links to supporting documents were gathered by the stakeholder groups and shared with ORSI electronically. The questions focused on:

- Design of quality virtual instruction

- Supports provided for implementing virtual instruction
- Perceived successes and challenges of virtual instruction and learning
- Changes that would better support staff, students, and families with virtual instruction and learning

Six interview responses were received and used for this report.

Data Analysis

ORSI did a content analysis for themes related to knowledge of best practices, design of FCPS' approach to virtual instruction, efforts to enhance instructional capacity and resources, intended and unintended outcomes.

Virtual Focus Groups

ORSI conducted focus groups with teachers, parents, and students. These groups were targeted with the expectation that they could provide different perspectives on the quality of instruction, student learning and well-being. Teacher and parent focus groups were conducted virtually via Blackboard and recorded. A facilitator asked the questions and summarized responses, while a scribe recorded the summarized responses and then consensus among group members.

Two different types of focus groups were conducted with students. One focus group was conducted with members of the Student Advisory Committee to gather information about their experiences with virtual learning and what they had heard from peers. A second set of student focus groups were held to understand the perspectives of students who had or had not experienced changes in performances during virtual instruction. The procedures for the student focus groups differed from the teacher and parent focus as detailed below.

Teacher and Parent Focus Groups
Description

Focus groups were convened for teachers with the expectation that they could provide different perspectives on how virtual instruction and learning were proceeding and on student wellbeing. Focus group notifications were sent to parents and teachers who were randomly selected to ensure representation across regions, school types and demographics. Everyone who responded they were available on the date and time of the focus group were invited to attend the virtual focus group.

Six teacher focus groups were held; three elementary groups (26 attended) and three secondary groups (25 attended) for a total of 51 participants. The teachers represented all grade levels (pre-kindergarten through high school), and included ESOL teachers, special education teachers, advanced academics teachers, and the four core content areas (English, mathematics, science, and social studies) for secondary students.

To gather parent perspective on teaching and learning during SY 2020-21, seven parent focus groups were convened. A total of 36 randomly selected parents attended one of four focus groups. In addition, separate focus groups were held for parents of students with disabilities (eight attended), and Spanish-speaking parents (two attended). To reach groups of parents whose voice is often not heard in the school system, ORSI collaborated with the Office of Family Engagement to hold a group with immigrant families (10 attended).

Focus groups were held virtually on Blackboard Collaborate. There was a facilitator and a recorder for each session. The objective of the groups was to understand teachers' and parents' experiences and how similar and dissimilar they were so the facilitator summarized perspectives for each question and then asked participants to indicate if they had a similar perspective. All groups were asked about their perceptions of the successes and challenges of teaching and learning this year, focusing on instruction, student learning, student self-direction and well-being as well as suggestions for improvement.

Student Focus Groups
Student Advisory Committee

To include student voice in the study, ORSI conducted two sets of student focus groups. For the first focus group, students serving on the Student Advisory Committee (SAC) were invited to participate in a focus about their and their peers' experiences during virtual instruction. All members were invited and a total of eleven students with both parent and student consent attended.

The focus groups were held through Blackboard Collaborate. The questions covered similar areas to the teacher and parent focus groups including perceptions of the quality of virtual instruction, the extent to which they were learning, self-regulation strategies, and well-being. To put students at ease, the focus groups were not recorded. Instead, students were assigned to small groups and provided the questions in writing. They were asked to discuss each question, scribe their perspectives, and then each group member indicated if they had the same perspective. Once students had responded to all the questions, they were asked to individually review what other groups had said and indicate if they had similar experiences or not and add comments if they wished. Though the process differed from the teacher and parent focus groups, all resulted in consensus statements.

Performance Groups

A second set of five student focus groups were held to understand more deeply the experiences of students who performed along the continuum of marks at the secondary level in the first quart of SY 2020-21 to try and understand the similarities and differences in learning they were experiencing that was contributing to their first quarter performance. High and middle school students were randomly selected to represent students whose grades had improved during virtual learning, decreased, or stayed the same (high school only). Students with both parent and student consent who were available on the date and time of the focus group participated in the virtual focus groups. A total of 25 students participated (13 students who experienced declines in performance in the fall, four who continued to have low levels of performance, and eight students whose performance had remained high or improved) The questions for these focus groups delved deeper into the factors that supported or hindered virtual instruction for students from their perspective, including learner-centered environment, self-direction, learning, and social-emotional and mental health.

Data Analysis

The comments generated by the teacher, parent, and students were summarized and coded for themes related to demonstration of the quality of instruction (Learning Model, TPACK), facilitators and barriers to student learning, student self-direction and support for self-direction, and student well-being. ORSI staff synthesized findings and used this qualitative data in conjunction with staff survey data to inform findings.

Surveys

ORSI surveyed families, school-based staff, and students to gather information on experiences with teaching and learning during the first part of SY 2020-21. Two types of surveys were used for this purpose:

(1) Check-In surveys to get a quick temperature of how teaching and learning was going; and (2) a comprehensive survey that expanded upon the questions to gather more detailed and inclusive information about implementation and outcomes.

Check-In Surveys

ORSI administered Check-In surveys to teachers, parents, and students at regular intervals between October 2020 and February 2021. The initial survey was distributed to all teachers, parents, and students in fourth through twelfth grade to form a baseline. Subsequent surveys were administered to a randomly selected set of teachers, parents and students. The results of these surveys were presented at the School Board Return to School meetings and through Brabrand Briefings.

Comprehensive Surveys

ORSI specifically designed comprehensive surveys, one each, for parents, elementary students, secondary students, teachers, principals, mental health staff (counselors, psychologists and social workers), and directors of student services to gather detailed information about implementation and supports for virtual instruction and learning.

Surveys were analyzed first by calculating descriptive information including means, standard deviations, minimums, and maximums, and frequencies of responses. Survey items were placed in a factor analysis to confirm that items aligned to constructs and reliabilities were calculated. Items were aggregated together to obtain an average across all items for each construct.

Parent Survey

Survey Design

The Parent Comprehensive Survey was designed by ORSI to gather information about learning experiences for a specific child since families might well have very different preferences and experiences with different children. Thus, families with multiple students attending FCPS were encouraged to complete the survey multiple times, once for each child. Prior to dissemination, surveys were shared with the study's advisory team and staff groups for feedback to ensure readability and inclusion of the most critical concerns.

The survey contained 57 items that asked families and caregivers demographic information as well as items their experiences with distance learning during Fall 2020. The following constructs were addressed on the parent comprehensive survey:

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Table B-1
Family Survey Construct

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Construct	Description
Demographic Information	Grade, School, Race/Ethnicity, Free- and- Reduced Meal status, English learner status, student with disabilities status, and advanced academic status
General Design	Families' perceptions of the design of synchronous and asynchrounous learning. It examined families' perceptions of whether the amount of time that students spent on schoolwork, homework, and screens was appropriate, and whether the design facilitated attendance in class.

Implementation: Equity in access to technology and devices	Families' perceptions of the extent to which their student had access to technology and troubleshooting support.
Implementation: Expand Mental Health/Well-being supports	Families perceptions of FCPS supports for mental health.
Implementation: TPACK – Learning Model	The extent to which students were receiving effective instruction, whether families were satisfied with the instruction their students received, and whether or not there were supports for different student needs, including special education, ESOL, and AAP services.
Implementation: Management	Families perceptions of teachers' ability to manage the classroom.
Implementation: Social/Communication	The extent to which there was communication between FCPS and schools with families.
Implementation: Student Self-Direction	Families' perceptions of the resources provided to help them support their student in independently carrying out their school and homework.
Outcomes: Learning	Families' perceptions that students learned what was taught.
Outcomes: Dependable Home-School Relationships	Families' perceptions of the mutual supports that families and schools provided to facilitate students' learning.
Outcomes: Positive Student Social-Emotional Well-Being	Famillies' perceptions of students' social-emotional well-being
Outcomes: Student Self-Direction	Famililes' perceptions of their student's ability to carry out the school and homework independently.
Outcomes: Engagement	Families' perceptions of their student's engagement in school

Survey Responses

The Family Survey received 55,029 responses. Table B-2 indicates the breakdown of the family survey responses by the requested correspondence language documented in the FCPS student information system in comparison to FCPS membership. The only non-English languages that did not receive responses were those that spoke Urdu. Table B-3 shows the breakdown of subgroup membership for students reported on in family surveys in relation to FCPS membership. Subgroup membership was based on parent and caregivers responses to questions on the survey. Even with outreach encouraging hard to reach families to participate in the survey, Table B-3 shows some subgroups remained underrepresented in the survey respondents when compared to FCPS membership. Specifically, survey responses about Black and Hispanic students were underrepresented in survey responses than in FCPS membership. Additionally, English learners and Economically Disadvantaged students were underrepresented in the survey responses than in FCPS membership.

Table B-2
Family Survey Completion Overall and by Correspondence Language
Compared to FCPS Membership
(Percentages and Counts)

Correspondence Language	Survey Respondents	FCPS Membership Extract
All Languages	55,029	179,724
English	86% (n=47,278)	80% (n=143,580)
Amharic	0.2% (n=181)	0.2% (n=233)
Arabic	1% (n=319)	1% (n=1,272)
Chinese	1% (n=415)	0% (n=626)
Farsi	0.1% (n=86)	0.2% (n=239)
Korean	2% (n=1,185)	1% (n=1,323)
Spanish	10% (n=5,291)	17% (n=30,673)
Urdu	0% (n=0)	0.2% (n=432)
Vietnamese	0.1% (n=274)	1% (n=1,346)

Table B-3
Family-Reported Subgroup Membership of Student
Compared to FCPS Membership[1]
(Percentages and Counts)

Family-Reported Subgroup	Survey Respondents	FCPS Membership
Asian	17% (n=9,617)	20% (n=35,582)
Black	6% (n=3,179)	10% (n=18,012)
Hispanic	16% (n=8,768)	27% (n=48,636)
White	43% (n=23,610)	37% (n=65,914)
Students with Disabilities	13% (n=5,835)	15% (n=26,995)
English Learners	9% (n=3,970)	18% (n=31,617)
Economically Disadvantaged	12% (n=6,184)	33% (n=60,076)
Advanced Academic Program	27% (n=11,705)	28% (n=50,149)
Elementary	55% (n=30,349)	51% (n=90,633)
Middle	13% (n=7,055)	17% (n=29,713)
High	32% (n=17,625)	33% (n=59,012)

[1] FCPS membership counts for English Learners include ELP levels 1 to 5 and 9; counts for Advanced Academic Program include levels 1 to 4.

Staff Surveys

Survey Design

Four staff comprehensive surveys were designed by FCPS' Office of Research and Strategic Improvement, including one for teachers, principals, director of student services, and mental health professionals. ORSI drafted the surveys with overlapping language, wherever possible.

Table B-4 provides information about the number of items, constructs, and construct description for each of the four surveys.

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Table B-4
Staff Comprehensive Survey Constructs by Respondent Group

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Construct	Description	Teacher 114 items	Principal 47 items	DSS 31 items	MHP 29 items
General Design	Staff perception on the amount of synchronous and asynchronous instruction students receive	X	X		
Input- Time	Principal perception of having enough time to plan and implement successful learning throughout the school		X		
Implementation: Address Basic Food and Safety Needs	Staff perception of whether students' basic needs were addressed by FCPS	X	X	X	X
Implementation: Social/ Communication	Staff perception of the communication between schools and families	X	X	X	X
Implementation: Equity in access to technology and devices	Staff perception of whether FCPS provided enough technology support to students, including access to a device and troubleshooting when needed	X	X	X	
Implementation: Expanded Mental Health/Well-being supports	Staff perception of whether FCPS provided adequate supports to support students' well-being.	X	X	X	X
Implementation: Management	Staff perception on how well the classroom was managed including expectation for student behaviors	X	X		

Implementation: Effective PD	Staff perception of the professional development they received on how to teach students in SY 2020-21	X	X		
Implementation: Effective PD for social-emotional supports	Staff perception of the professional development they received on how to support students social-emotional well-being	X	X	X	X
Implementation: Enhanced Capacity/ Academic Resources	Staff perception on the availability of resources for effective teaching and learning during SY2020-21	X	X		
Implementation: Enhanced Capacity/ Well-being Resources	Staff perception on the availability of resources for effectively supporting students' social-emotional well-being	X	X	X	X
Implementation: Student Self-Direction	Staff perception on their ability to facilitate students' executive functioning skills	X	X		
Implementation: TPACK Learning Model	Staff perception of their ability to implement the learning model and incorporate the elements of TPACK, including satisfaction with content, rigor, delivery of instruction, and assessment.	X	X		
Implementation: TPACK Technology Integration	Staff perception of their ability ot integrate technology that facilitated meaningful learning for students	X	X		
Implementation: Teacher Willingness to Learn	Staff perception of teachers' willingness to be creative and take risks in their instruction	X	X		
Outcomes: Students' basic needs met	Staff perceptions of whether students' food and safety needs were met.	X	X	X	X
Outcomes: Context from previous years	Staff perceptions of whether or not this year yielded different engagement, attendance, behaviors, and stress from students compared ot other years	X	X	X	X
Outcomes: Reliable Identification of Students in Crisis	Staff perceptions of their ability to identify students in crisis and reach out to help them get the necessary supports	X	X	X	X

Outcomes: Quality Data to Measure Progress	Staff perceptions of whether or not they could adequately assess students	X			
Outcomes: Dependable Home-School Relationships	Teacher perception of their relationship with families in providing supports to students.	X			
Outcomes: Positive Student Social-Emotional Well-Being	Staff perceptions of whether or not students were overall experiencing positive well-being	X	X	X	X
Outcomes: Improved Student Self-Direction	Teacher perceptions of their students' ability to carry out their school and homework independently	X			
Outcomes: Increased Student Proficiency with Technology	Teacher perceptions of students' proficiency with technology				
Outcomes: Increased Teacher Efficacy	Teacher perception of their capability to teach effectively	X			
Outcomes: Enhanced Instruction	Staff perception on the improvement of teachers in delivering lessons that integrate TPACK	X	X		
Outcomes: Engagement	Teacher perception of student engagement	X			
Outcomes: Staff Workload	Staff perception of their workload (and principals' perceptions of their staff's workload)	X	X	X	X
Outcomes: Staff Stress	Staff perception of their stress	X	X	X	X

Survey Responses

The response rate for the staff surveys was 40 percent, which reflects 6,534 staff of the 16,464 who were sent a survey invitation. Table B-5 shows the breakdown of position types within FCPS (number of invitations delivered) and of survey completers, as well as the response rate overall and within position type. Principals had the highest response rate (44 percent), followed by teachers (40 percent).

Table B-5
Staff Survey Response Rates, Overall and by Position Type

Instrument	Number of Invitations Delivered	Number of Surveys Completed	Response Rate
Teachers	6,174	15,270	40%
Principals	85	194	44%
Director of Student Services	257	943	27%
Mental Health Professional	18	57	32%

Student Surveys

Survey Design

A secondary student and elementary student comprehensive survey were designed by FCPS' Office of Research and Strategic Improvement. ORSI drafted the surveys to have as much overlap as possible, while maintaining developmental appropriateness of the questions. Students were asked to provide their voice about how teaching and learning was going for them in Fall 2020. The survey includes their perceptions of the instruction they received as well as their perceptions about their engagement and participation in class and their well-being. The sample of secondary students included all of the middle and high school grades, whereas the elementary student sample including only 4th through 6th grade students.

Table B-6 provides information about the number of items, constructs, and construct description for each of the four surveys.

Table B-6
Student Comprehensive Survey Constructs by Respondent Group

Construct	Description	Secondary 73 items	Elementary 69 items
General Design	Student perception on the amount of synchronous and asynchronous instruction students receive	X	X
Implementation: Social/ Communication	Student perception of the communication and relationship between students and teachers	X	X
Implementation: Equity in access to technology and devices	Student perception of whether FCPS provided enough technology support to students, including access to a device and troubleshooting when needed	X	X
Implementation: Management	Student perception on how well the classroom was managed including expectation for student behaviors	X	

Implementation: Enhanced Capacity/ Well-being Resources	Student perception on the availability of resources for effectively supporting students' social-emotional well-being	X	
Implementation: Student Self-Direction	Student perception on teachers' supports to facilitate executive functioning skills	X	X
Implementation: TPACK Learning Model	Student perception of the implementation the learning model and other elements of TPACK, including satisfaction with content, rigor, delivery of instruction, and assessment.	X	X
Implementation: TPACK Technology Integration	Student perception of teachers' ability to integrate technology that facilitated meaningful learning for students	X	X
Outcomes: Students' basic needs met	Student perceptions of whether their food and safety needs were met.	X	X
Outcomes: Reliable Identification of Students in Crisis	Staff perceptions of their ability to identify students in crisis and reach out to help them get the necessary supports	X	X
Outcomes: Quality Data to Measure Progress	Staff perceptions of whether or not they could adequately assess students	X	
Outcomes: Dependable Home-School Relationships	Teacher perception of their relationship with families in providing supports to students.	X	
Outcomes: Positive Student Social-Emotional Well-Being	Student perception of their stress this year.	X	X
Outcomes: Improved Student Self-Direction (metacognition)	Student perceptions of their ability to think about their learning and schoolwork outside of instruction	X	X

Outcomes: Improved Student Self-Direction (time management)	Student perception of their ability to manage their time outside of the classroom	X	X
Outcomes: Increased Student Proficiency with Technology	Student perception of their ability to use technology	X	X

Survey Responses

Response rates for students are not available at this time.

Outcomes

ORSI staff obtained outcome data through data requests to the Department of Information Technology (marks) and the Office of Student Testing (iReady assessment data). To measure elementary student performance the study compared first and second quarter marks for SY 2020-21 to SY 2019-20 in the areas of language arts, mathematics, social studies, and science. The study also measured the third-grade indicator of reading on grade level and iReady reading and mathematics assessments to examine the effects of virtual instruction on student learning. To assess the effects of virtual learning on middle and high school students' learning, ORSI staff calculated the percent of letter-grades (e.g., 5% A) across courses.

APPENDIX C

ADDITIONAL DETAIL ON OUTCOMES

Appendix Overview

This appendix includes charts with additional outcome data from FCPS' teaching and learning study.

Elementary Marks

Figure C-1: Distribution of Elementary Language Arts Marks, Quarters 1 and 2, SY 2019-20 and SY 2020-21
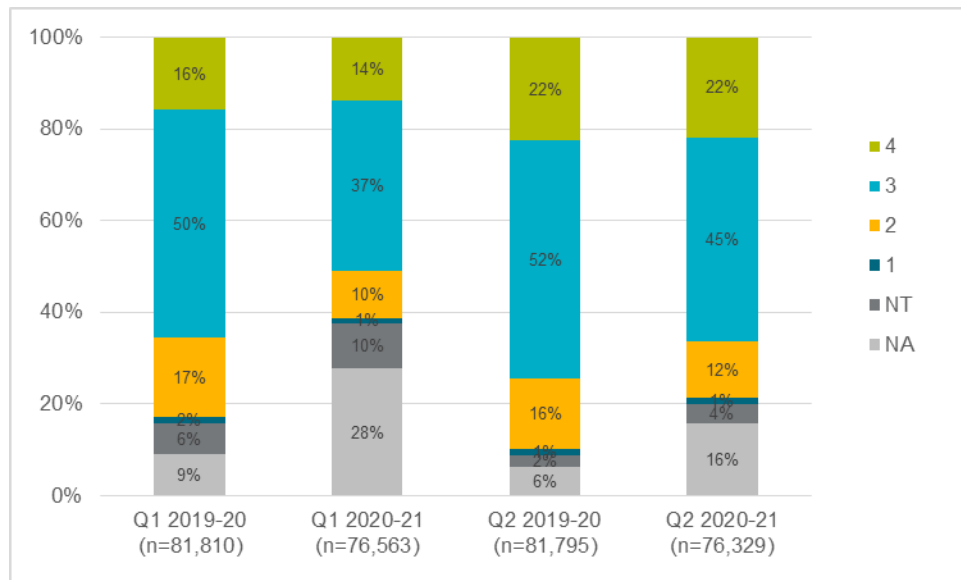
Figure C-2: Distribution of Elementary Mathematics Marks, Quarters 1 and 2, SY 2019-20 and SY 2020-21
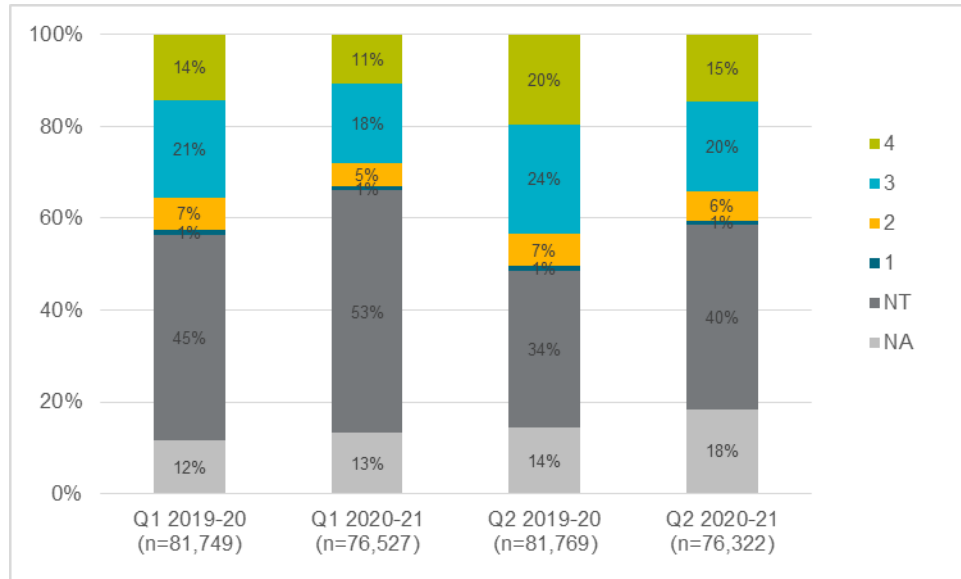
Figure C-3: Distribution of Elementary Social Studies Marks, Quarters 1 and 2, SY 2019-20 and SY 2020-21

Figure C-4: Distribution of Elementary Science Marks, Quarters 1 and 2, SY 2019-20 and SY 2020-21
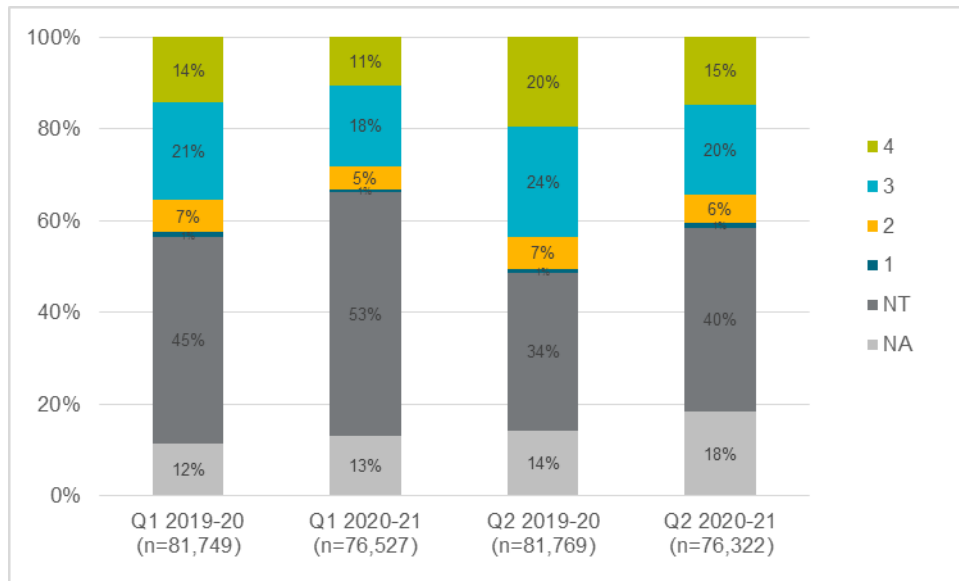
Elementary Marks and Reading on Grade Level by Student Group

Table C-1: Distribution of Elementary Marks and Indication of Reading on Grade Level, Quarters 1 and 2,

SY 2019-20 and SY 2020-21 for Asian Students

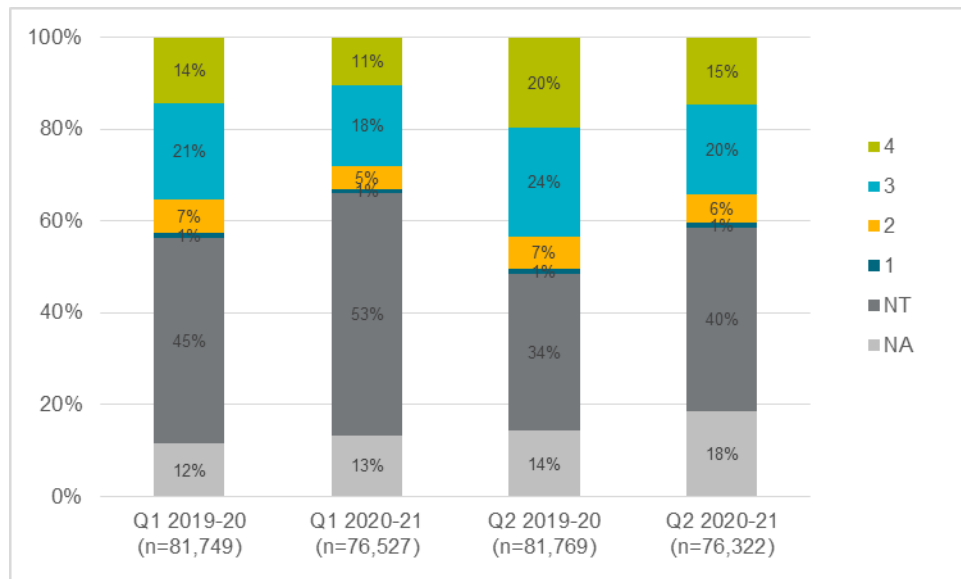| Marks	Q1 2019-20	Q1 2020-21	Q2 2019-20	Q2 2020-21
Language Arts				
4	21%	19%	29%	29%
3	51%	39%	52%	44%
2	12%	7%	10%	8%
1	1%	1%	1%	1%
NT	6%	9%	2%	4%
NA	9%	26%	6%	15%
n	15,661	14,839	15,628	14,852
Mathematics				
4	20%	15%	26%	21%
3	19%	16%	20%	17%
2	4%	3%	4%	3%
1	1%	0%	1%	0%
NT	45%	53%	35%	40%
NA	12%	13%	15%	18%
n	15,631	14,804	15,609	14,822
Social Studies				
4	24%	18%	33%	29%
3	23%	18%	29%	26%
2	3%	2%	4%	4%
1	0%	0%	0%	0%
NT	34%	41%	17%	19%
NA	16%	19%	18%	22%
n	10,443	9,893	10,419	9,907

Science				
4	21%	16%	26%	21%
3	25%	20%	26%	23%
2	3%	2%	3%	3%
1	0%	0%	0%	0%
NT	41%	46%	30%	33%
NA	9%	15%	14%	18%
n	10,440	9,892	10,422	9,906
Reading on Grade Level				
Above	23%	16%	24%	20%
On	64%	76%	64%	65%
Below	13%	8%	12%	14%
n	15,625	1,548	15,607	14,643

Table C-2: Distribution of Elementary Marks and Indication of Reading on Grade Level, Quarters 1 and 2,

SY 2019-20 and SY 2020-21 for Black Students

Marks	Q1 2019-20	Q1 2020-21	Q2 2019-20	Q2 2020-21
Language Arts				
4	12%	11%	17%	17%
3	51%	38%	54%	45%
2	21%	12%	19%	15%
1	2%	1%	2%	2%
NT	7%	10%	3%	5%
NA	8%	28%	6%	16%
n	7,680	7,462	7,683	7,445
Mathematics				
4	10%	8%	14%	11%
3	23%	18%	26%	21%
2	10%	7%	10%	8%
1	1%	1%	1%	1%
NT	45%	53%	35%	40%
NA	11%	13%	13%	18%
n	7,677	7,468	7,685	7,441
Social Studies				
4	15%	11%	20%	18%
3	27%	21%	36%	30%
2	6%	4%	8%	8%
1	1%	1%	1%	1%
NT	37%	43%	18%	21%
NA	14%	20%	17%	22%
n	5,115	4,977	5,125	4,967
Science				

4	12%	10%	16%	13%
3	30%	22%	33%	28%
2	6%	4%	7%	6%
1	1%	1%	1%	1%
NT	43%	47%	30%	33%
NA	9%	17%	13%	18%
n	5,122	4,966	5,123	4,967
Reading on Grade Level				
Above	11%	6%	12%	9%
On	66%	74%	66%	64%
Below	24%	20%	22%	27%
n	7,652	735	7,659	7,286

Table C-3: Distribution of Elementary Marks and Indication of Reading on Grade Level, Quarters 1 and 2,

SY 2019-20 and SY 2020-21 for Hispanic Students

Marks	Q1 2019-20	Q1 2020-21	Q2 2019-20	Q2 2020-21
Language Arts				
4	7%	6%	11%	11%
3	46%	33%	51%	42%
2	28%	17%	26%	22%
1	4%	3%	3%	3%
NT	7%	11%	3%	5%
NA	9%	30%	6%	18%
n	21,676	20,492	21,689	20,426
Mathematics				
4	7%	5%	11%	7%
3	21%	16%	26%	20%
2	13%	10%	13%	12%
1	2%	2%	2%	2%
NT	45%	53%	34%	40%
NA	11%	14%	14%	19%
n	21,663	20,490	21,675	20,446
Social Studies				
4	11%	8%	15%	12%
3	26%	20%	36%	29%
2	7%	6%	11%	11%
1	1%	1%	2%	2%
NT	38%	44%	18%	21%
NA	16%	21%	19%	24%
n	14,438	13,662	14,462	13,623
Science				

4	10%	6%	13%	9%
3	30%	20%	34%	26%
2	8%	7%	9%	9%
1	1%	1%	1%	2%
NT	42%	47%	29%	34%
NA	9%	18%	14%	20%
n	14,454	13,648	14,449	13,621
Reading on Grade Level				
Above	6%	3%	7%	5%
On	54%	75%	54%	49%
Below	39%	23%	38%	46%
n	21,602	1,952	21,638	19,748

Table C-4: Distribution of Elementary Marks and Indication of Reading on Grade Level, Quarters 1 and 2,

SY 2019-20 and SY 2020-21 for White Students

Marks	Q1 2019-20	Q1 2020-21	Q2 2019-20	Q2 2020-21
Language Arts				
4	19%	16%	27%	26%
3	52%	40%	53%	47%
2	13%	7%	11%	8%
1	1%	0%	1%	0%
NT	6%	9%	2%	4%
NA	10%	27%	6%	15%
n	31,388	28,506	31,377	28,346
Mathematics				
4	17%	13%	23%	18%
3	22%	19%	23%	20%
2	5%	3%	4%	4%
1	0%	0%	0%	0%
NT	45%	53%	34%	40%
NA	12%	13%	15%	18%
n	31,377	28,497	31,383	28,351
Social Studies				
4	24%	17%	32%	28%
3	23%	19%	30%	28%
2	3%	2%	4%	3%
1	0%	0%	0%	0%
NT	35%	41%	16%	19%
NA	15%	20%	18%	22%
n	20,919	19,001	20,922	18,902
Science				

4	21%	16%	26%	21%
3	26%	21%	27%	24%
2	3%	2%	3%	3%
1	0%	0%	0%	0%
NT	42%	46%	30%	33%
NA	9%	16%	14%	19%
n	20,928	18,996	20,930	18,908
Reading on Grade Level				
Above	16%	8%	18%	15%
On	71%	84%	70%	69%
Below	13%	9%	12%	15%
n	31,312	2,816	31,339	28,052

Table C-5: Distribution of Elementary Marks and Indication of Reading on Grade Level, Quarters 1 and 2,

SY 2019-20 and SY 2020-21 for Economically Disadvantaged Students

Marks	Q1 2019-20	Q1 2020-21	Q2 2019-20	Q2 2020-21
Language Arts				
4	7%	6%	10%	10%
3	46%	34%	52%	43%
2	28%	17%	27%	21%
1	4%	2%	3%	3%
NT	7%	11%	3%	5%
NA	8%	30%	6%	17%
n	24,410	21,691	24,168	21,546
Mathematics				
4	7%	5%	11%	7%
3	22%	17%	27%	21%
2	13%	9%	13%	12%
1	2%	2%	2%	2%
NT	45%	53%	34%	40%
NA	11%	14%	13%	19%
n	24,397	21,700	24,164	21,544
Social Studies				
4	10%	8%	14%	11%
3	27%	21%	37%	30%
2	8%	6%	11%	11%
1	1%	1%	2%	2%
NT	39%	44%	18%	21%
NA	15%	20%	19%	24%
n	16,259	14,463	16,116	14,365
Science				

4	9%	6%	12%	9%
3	30%	21%	35%	27%
2	8%	7%	9%	9%
1	1%	1%	1%	2%
NT	42%	47%	30%	34%
NA	9%	18%	13%	19%
n	16,276	14,443	16,100	14,359
Reading on Grade Level				
Above	5%	3%	6%	4%
On	55%	74%	55%	51%
Below	40%	23%	39%	45%
n	24,317	2,095	24,127	20,875

**Table C-6: Distribution of Elementary Marks and Indication of Reading on Grade Level, Quarters 1 and 2,**

SY 2019-20 and SY 2020-21 for English Learner Students

Marks	Q1 2019-20	Q1 2020-21	Q2 2019-20	Q2 2020-21
Language Arts				
4	3%	4%	6%	7%
3	42%	30%	49%	41%
2	33%	20%	32%	25%
1	5%	3%	4%	4%
NT	8%	12%	3%	5%
NA	9%	31%	6%	18%
n	20,781	19,109	20,571	18,905
Mathematics				
4	6%	4%	10%	6%
3	22%	17%	28%	20%
2	15%	11%	15%	13%
1	3%	2%	3%	3%
NT	43%	50%	31%	38%
NA	12%	16%	14%	20%
n	20,769	19,106	20,566	18,909
Social Studies				
4	8%	6%	11%	9%
3	26%	20%	36%	29%
2	9%	7%	13%	13%
1	2%	1%	2%	3%
NT	40%	45%	19%	22%
NA	16%	21%	19%	25%
n	13,841	12,735	13,714	12,603
Science				

4	8%	5%	10%	7%
3	31%	21%	35%	26%
2	10%	7%	11%	10%
1	2%	1%	2%	2%
NT	40%	46%	29%	33%
NA	10%	19%	14%	20%
n	13,856	12,729	13,703	12,599
Reading on Grade Level				
Above	2%	1%	2%	1%
On	46%	65%	47%	41%
Below	52%	34%	51%	58%
n	20,706	1,711	20,516	18,313

SY 2019-20 and SY 2020-21 for Students With Disabilites

Marks	Q1 2019-20	Q1 2020-21	Q2 2019-20	Q2 2020-21
Language Arts				
4	6%	6%	9%	10%
3	43%	36%	49%	45%
2	30%	18%	29%	21%
1	4%	2%	3%	3%
NT	7%	10%	3%	5%
NA	10%	28%	7%	16%
n	11,093	10,287	11,010	10,192
Mathematics				
4	8%	6%	11%	9%
3	21%	18%	26%	21%
2	13%	9%	13%	10%
1	2%	2%	2%	2%
NT	45%	53%	34%	40%
NA	11%	13%	14%	18%
n	11,082	10,290	11,002	10,195
Social Studies				
4	12%	9%	15%	14%
3	25%	20%	34%	29%
2	9%	6%	12%	10%
1	2%	1%	2%	2%
NT	37%	44%	18%	22%
NA	16%	21%	19%	23%
n	7,388	6,863	7,340	6,791
Science				

4	10%	8%	13%	10%
3	27%	21%	31%	26%
2	9%	6%	11%	8%
1	2%	1%	2%	2%
NT	42%	47%	30%	34%
NA	10%	17%	14%	19%
n	7,393	6,853	7,334	6,792
Reading on Grade Level				
Above	5%	1%	5%	4%
On	49%	55%	49%	47%
Below	46%	44%	45%	48%
n	11,070	1,430	10,995	9,968

iReady Reading and Math

**Figure C-7: iReady Benchmark Performance, Reading and Math,
SY 2018-19/2019-20 and SY 2020-21**
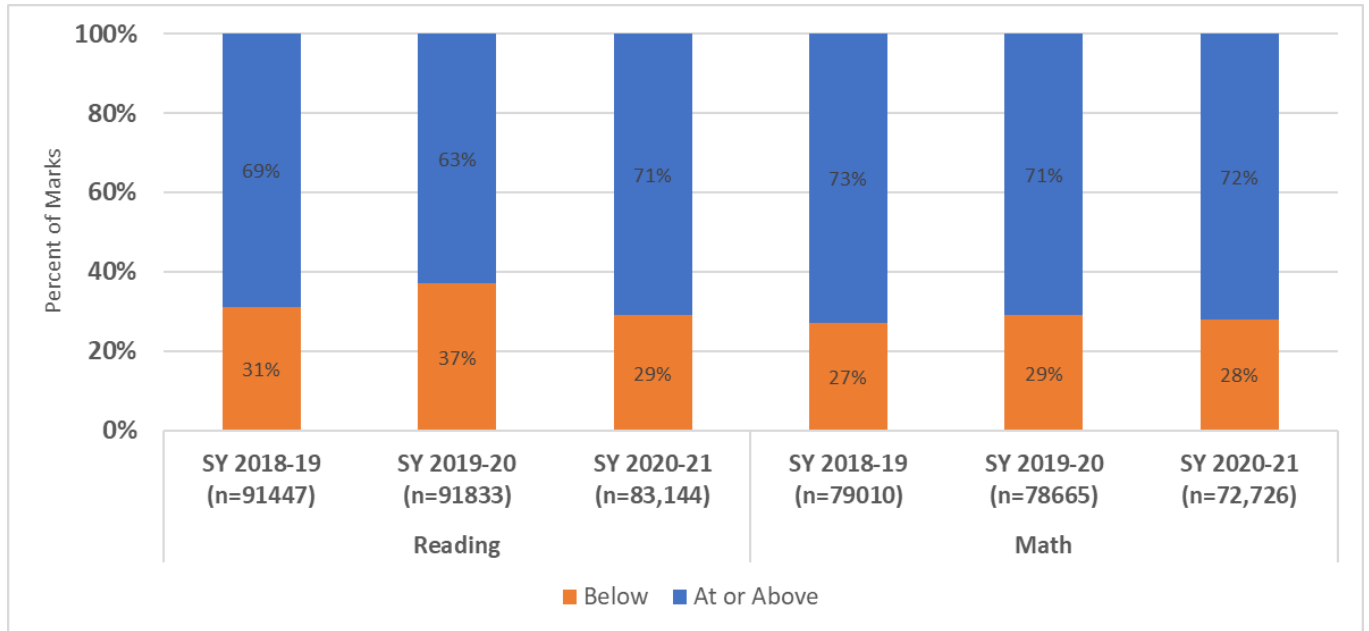
## Figure C-8: iReady Benchmark Performance, Reading and Math, SY 2018-19 through 2020-21 by Race/Ethnicity

Asian

Black

Hispanic

Reading:
- SY 2018-19 (n=22936): Below 55%, At or Above 45%
- SY 2019-20 (n=23180): Below 64%, At or Above 36%
- SY 2020-21 (n=20787): Below 55%, At or Above 45%

Math:
- SY 2018-19 (n=20044): Below 49%, At or Above 51%
- SY 2019-20 (n=20163): Below 54%, At or Above 46%
- SY 2020-21 (n=18316): Below 53%, At or Above 47%

Below ■ At or Above

White

Reading:
- SY 2018-19 (n=36060): Below 20%, At or Above 80%
- SY 2019-20 (n=35811): Below 25%, At or Above 75%
- SY 2020-21 (n=31785): Below 18%, At or Above 82%

Math:
- SY 2018-19 (n=30776): Below 17%, At or Above 83%
- SY 2019-20 (n=30642): Below 18%, At or Above 81%
- SY 2020-21 (n=27850): Below 18%, At or Above 82%

Below ■ At or Above

**Figure C-9: iReady Benchmark Performance, Reading and Math,
SY 2018-19 through 2020-21 by Student Group**

Free-and-Reduced Student Meal Status
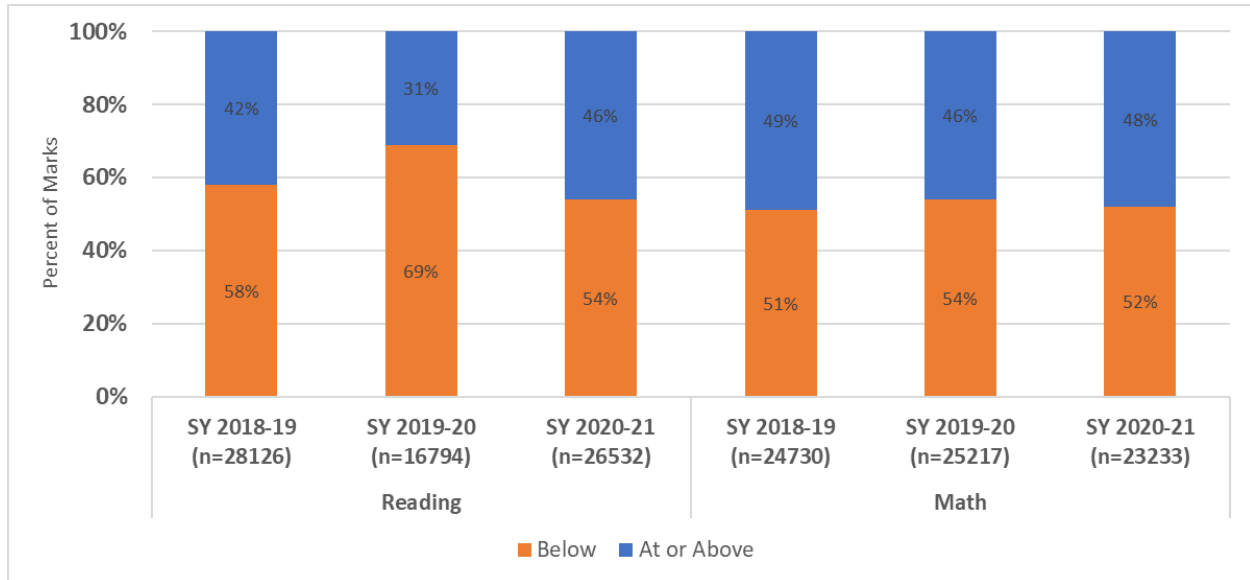
English Learners
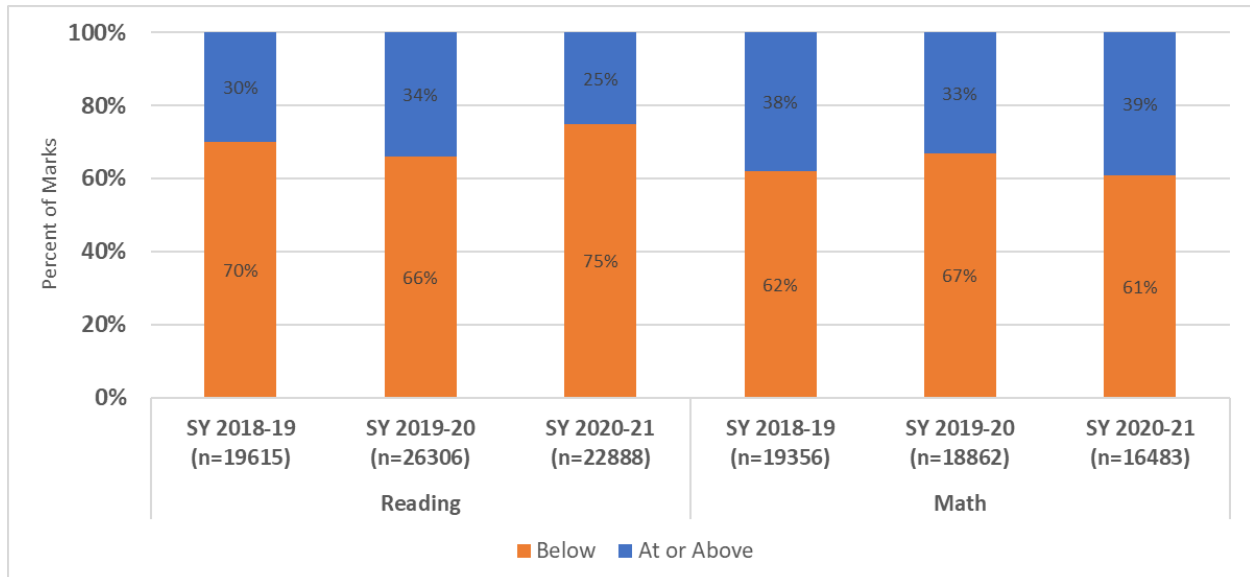
Students with Disabilities
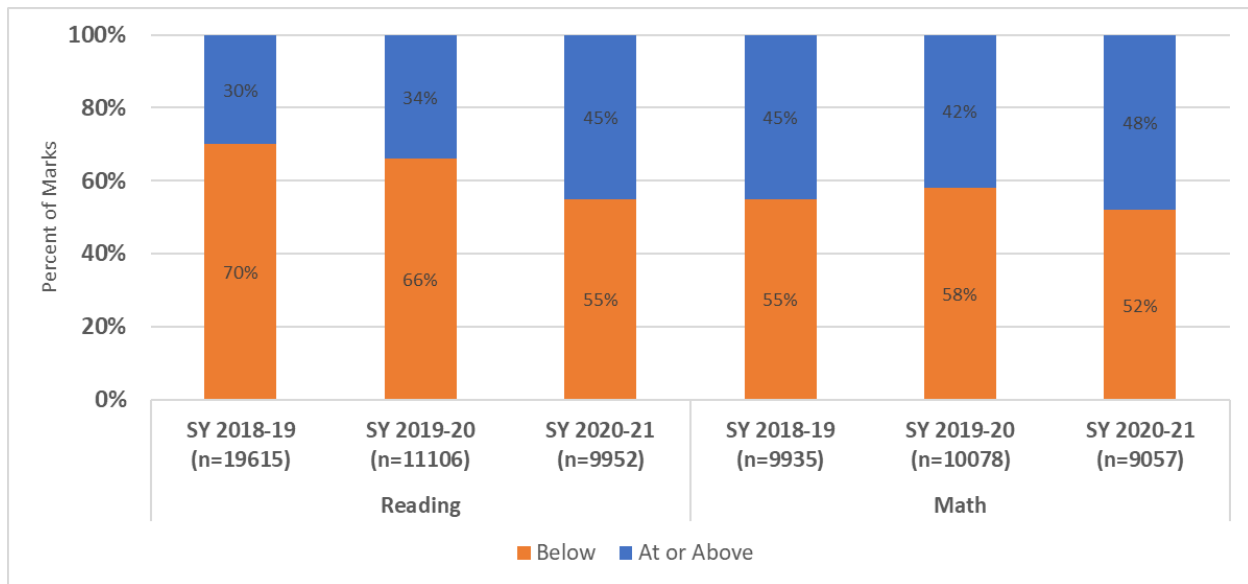
Secondary Marks

Figure C-10: Secondary Student Performance Across Courses, Quarters 1 and 2, SY 2018-19/2019-20 and SY 2020-21
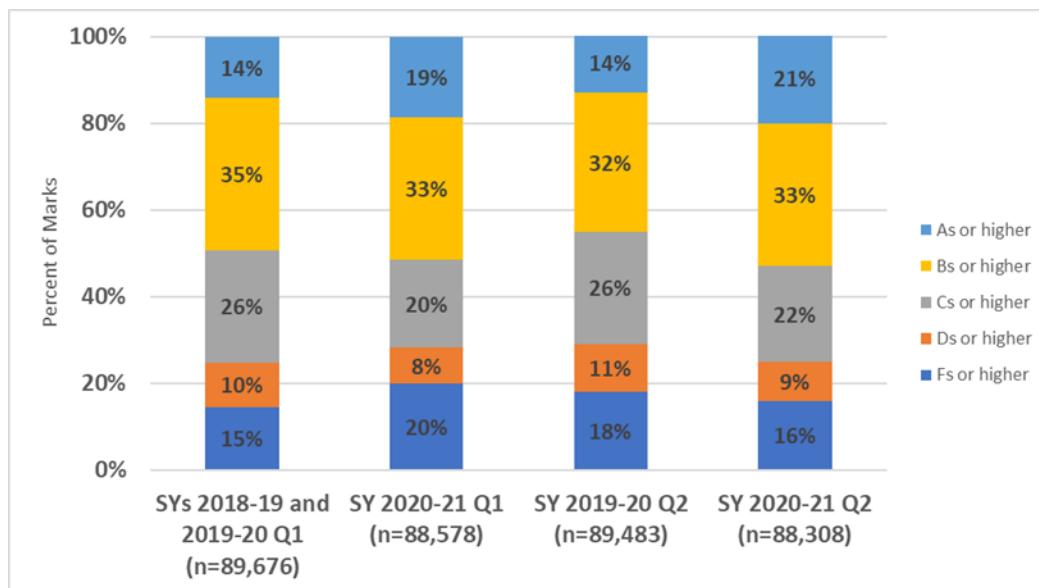
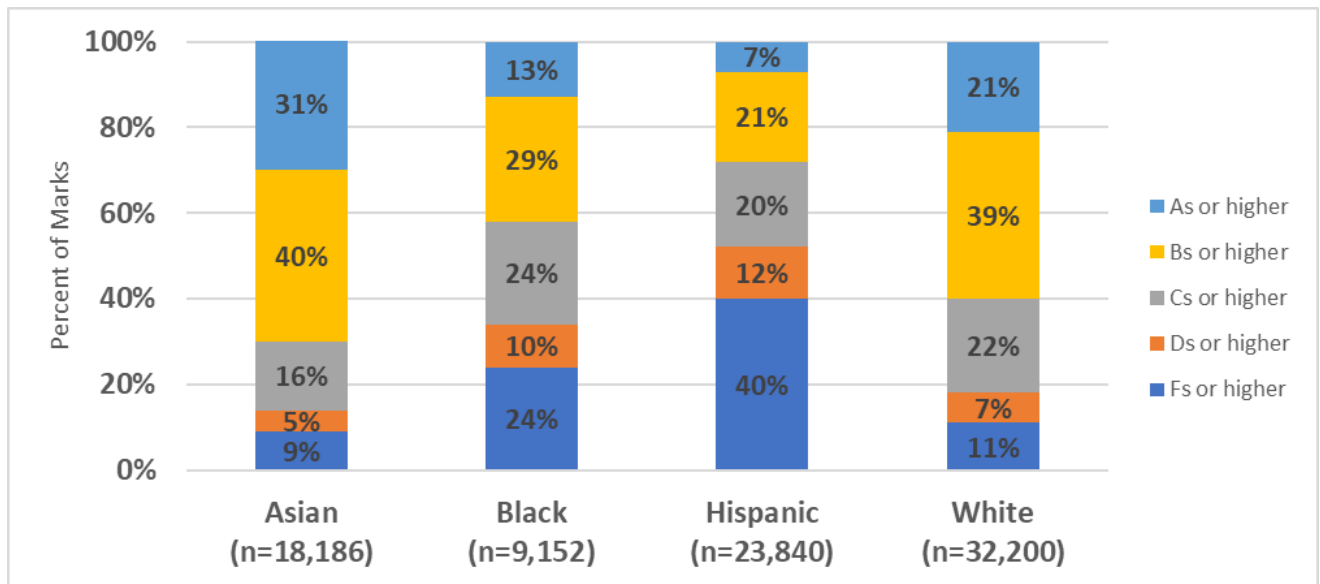**Figure C-11: Secondary Student Performance, Quarter 1 SY 2020-21 by Race/Ethnicity**

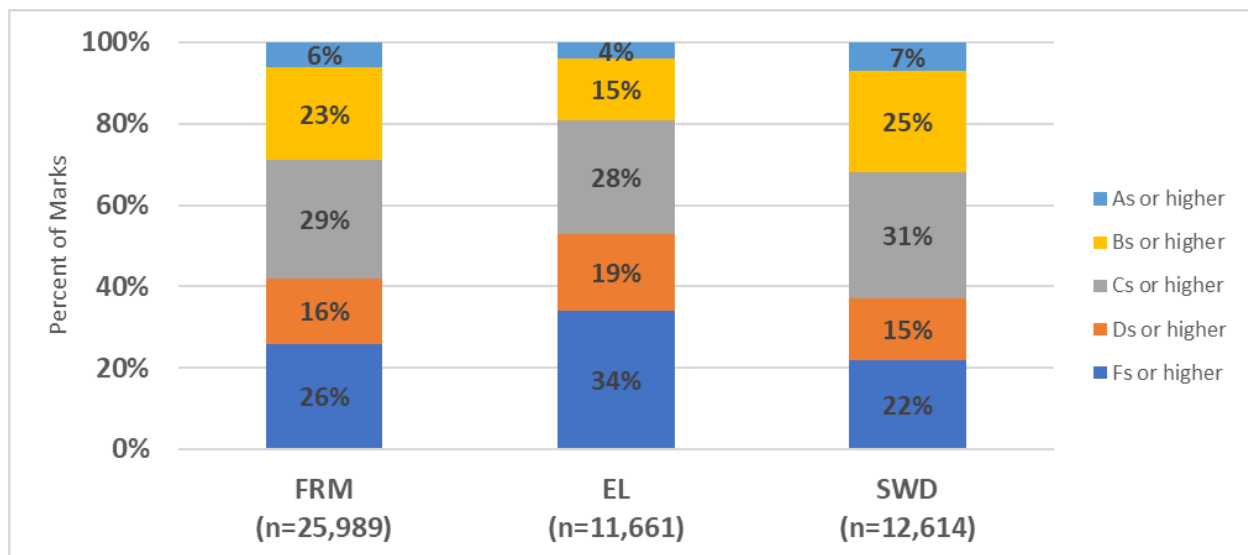**Figure C-12: Secondary Student Performance, Quarter 1 SY 2020-21 by Student Group**
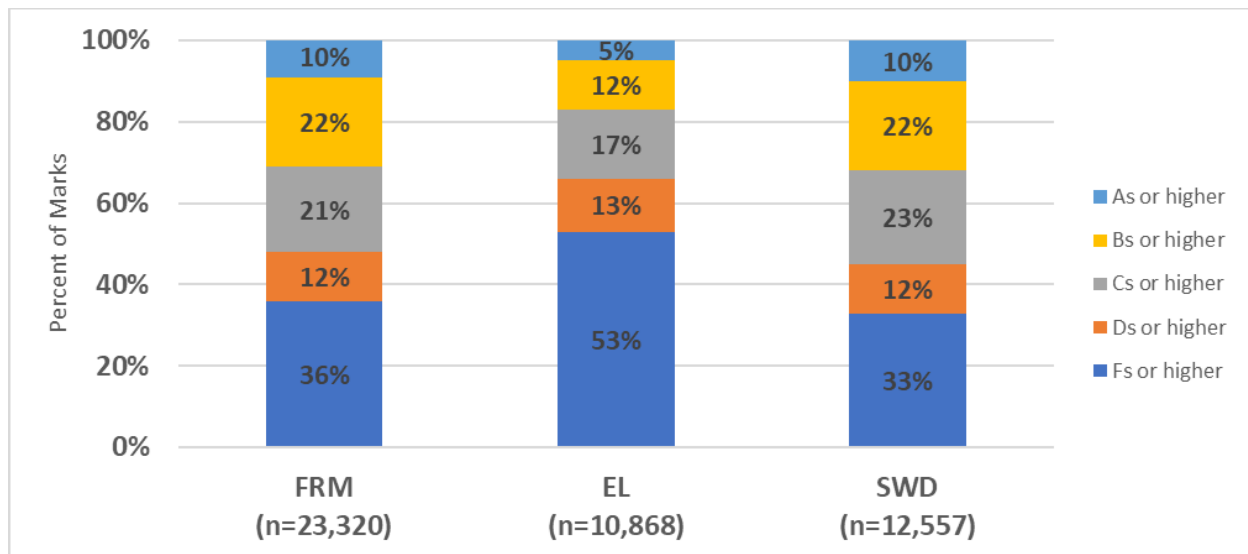
Figure C-13: Secondary Student Performance, Quarter 1 SY 2019-20 by Race/Ethnicity
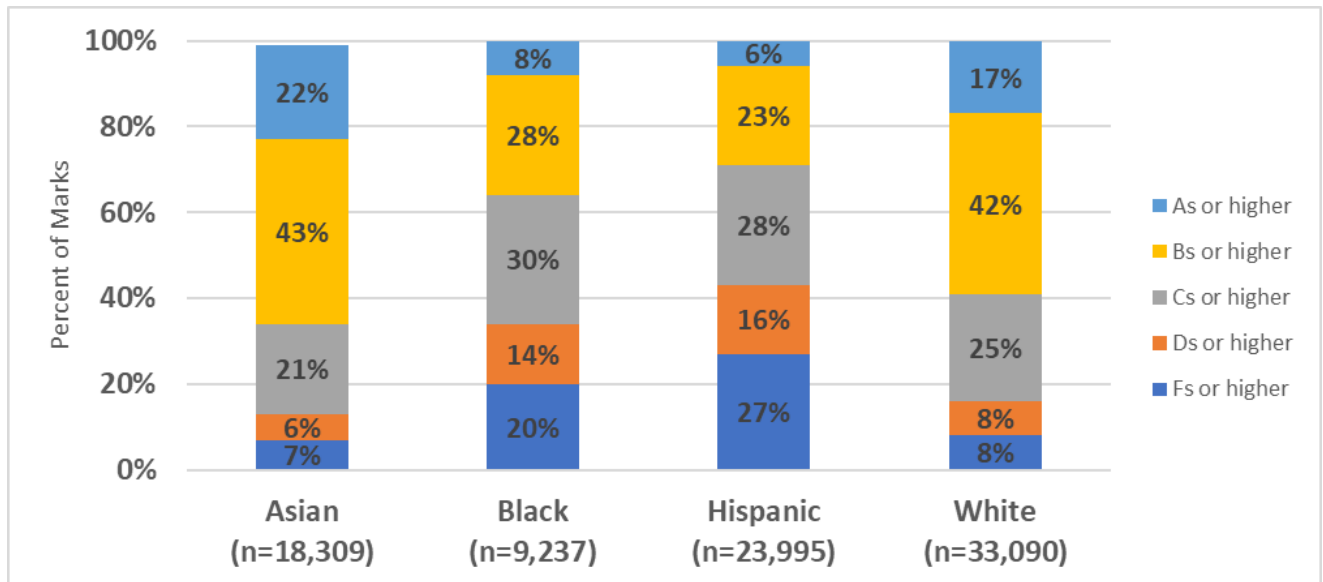
Figure C-14: Secondary Student Performance, Quarter 1 SY 2019-20 by Student Group

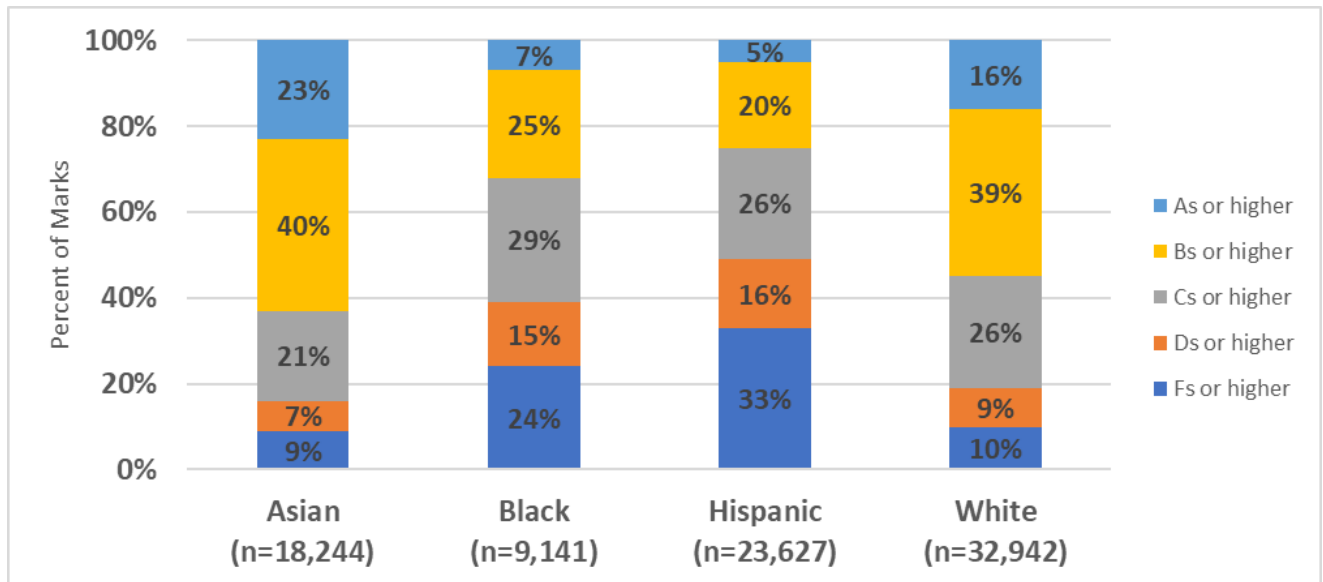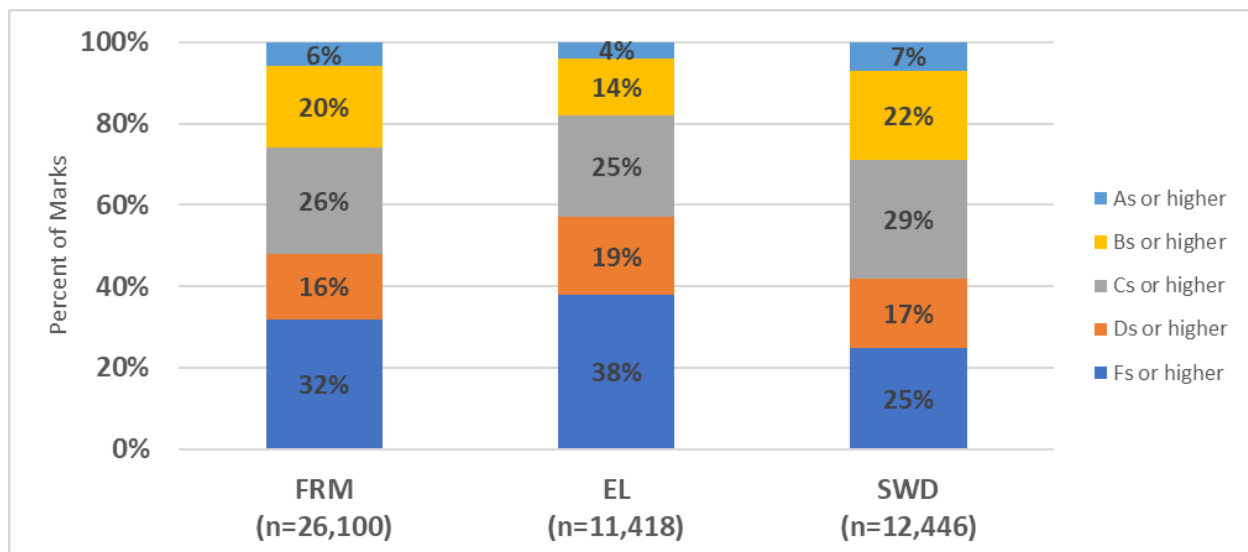**Figure C-15: Secondary Student Performance, Quarter 2 SY 2019-20 by Race/Ethnicity**

Figure C-16: Secondary Student Performance, Quarter 2 SY 2019-20 by Student Group

APPENDIX D

RESEARCH-BASED ELEMENTS OF VIRTUAL TEACHING AND LEARNING APPROACH

The approach/design for instruction this year addresses more of the research-based components than it did last spring.

Virtual learning requires that school divisions address multiple elements to support teacher development of new knowledge, skills, and abilities to make the transition from face-to-face instruction to online instruction. As noted in the June 2020 report, reviews of the literature have identified eight elements districts need to address for effective online instruction. The finding at that time noted that FCPS' framework fully addressed two of the elements, social/communication and teacher willingness to learn and somewhat addressed the others: pedagogy, technology, content, design, management, and student self-direction. In fall 2020, FCPS enhanced the approach to virtual learning as well as prepared for concurrent instruction (instruction which is accessible by students in school and at home at the same time.)

Table F-1 presents the comparison of FCPS efforts to the eight elements outlined by literature and the rating from Report 1. A description of the elements and the rationale for the rating follow the table.

Table F-1. Comparison of Design to Research

Element	Comparison to Research February 2021
TPACK	Somewhat Addressed
Design	Somewhat Addressed
Management	Somewhat Addressed
Social/ Communication	Fully Addressed
Teacher Willingness to Learn	Fully Addressed
Student self-direction	Somewhat Addressed

TPACK

FCPS continued to set expectations for instruction that addressed all of the research-based elements in some capacity. Growth in design of the management component was noted, moving that element from Somewhat Addressed to Fully Addressed. Specifically, FCPS more clearly outlined roles and responsibilities for teaching and learning in SY 2020-21, provided professional development regarding classroom management strategies in a virtual environment using various technology platforms, and provided support for how to organize the virtual classroom. And while FCPS developed professional development and resources that connected technology to the Instructional Framework (Pedagogy), integration of these two elements with content was not observed or communicated as expectations for staff at all school levels and content areas. Each grade level and content area had streamlined curriculum and planning and pacing guides. The majority had some examples of a few units that could be adapted for use by teachers. However, there was no explanation of how the unit was designed to reflect the teaching of content through best instructional practices while making choices regarding the best instructional tools to use to do so.

The Digital Eco-system provided examples for the selection of technology tools matched to instructional practices. However, it did not provide expectations, detailed descriptions, or exemplars of high-quality instructional resources for how to integrate these two elements into content. It relied upon teachers' knowledge of properly identifying instructional best practices (pedagogy) to content and then selecting the appropriate technology and integrating it into instruction. This lack of definition likely contributed to teacher challenges described by focus group participants and their desire to have exemplars to guide their practice virtually and with quality.

Pedagogy

Online instruction requires teachers to apply their pedagogical knowledge to a new context; thus while the principles are the same, how teachers go about applying them must take the context into consideration. The National Standards for Quality Online Teaching[2] emphasizes this point in Standard B that teacher "supports learning and facilitates presence (teacher, social, and learner) with digital tools." Teachers apply their knowledge of different learning theories, instructional strategies, and student engagement techniques to select appropriate tools. Teachers need to organize and facilitate students' participation in class and provide guidance and support to structure students learning, as well as, promote student-to-student interactions, collaboration and teamwork. They need to be aware of techniques to keep students motivated and energized[3,4].

FCPS Efforts. FCPS has the expectation that learning continue throughout SY 2020-21, whether school is taking place in-person or virtually. FCPS established divisionwide bell schedules and sample school schedules to guide schools in organizing the learning day. In addition, the division set an expectation for both synchronous and asynchronous learning, with Mondays as a day for student interventions, independent learning and teacher professional development and Tuesday through Friday serving as synchronous learning time.

There was professional development for teachers prior to students returning for SY 2020-21 on designing meaningful learning experiences online, including outcomes related to facilitating engaging, student-centered synchronous and asynchronous learning, using whole and small groups effectively, differentiating learning, providing discussion opportunities, and gathering feedback. In addition, reflection of learning for teachers included the opportunity to identify the best online instructional tools to support different pedagogical strategies.

FCPS provided many resources to staff on a variety of pedagogical topics through the Teaching Considerations portion of the Return to School 20-21 Google site. Topics included building an online community, routines and procedures in an online environment, teaching in an online environment, blended learning, and assessment. The Digital Ecosystem provides a library of tools that can be used, searchable by purpose with a description of the tool and the level of approval for use in FCPS (fully or with conditions.) FCPS developed the Concurrent Instruction PD Guidebook to prepare for the time when the division would move to instruction that mixed in-person and virtual learning. Several sections of the Guidebook provide pedagogical tools, including classroom management and instructional structures and models.

Technology

To provide quality instruction, teachers must be adept at using an array of online tools, systems, and software[5]. This includes understanding the advantage and limitations of the tools as well as being aware of new tools as they become available. In the absence of these skills, teachers may not be able to solve technology issues for themselves or assist student in technology issue they are having. Valuable instructional time can be taken up trying to solve technology glitches. Lack of knowledge and/or comfort

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[2] Virtual Learning Leadership Alliance (2019). *National Standards for Quality Online Teaching*. Third Edition
[3] Bailey, C. J., & Card, K. A. (2009). Effective pedagogical practices for online teaching: Perception of experienced instructors. *The Internet and Higher Education*, *12*(3), 152- 155.
[4] Munoz Carril, P. C., Gonzalez Sanmamed, M., & Hernandez Selles, N. (2013). Pedagogical roles and competencies of university teachers practicing in the elearning environment. *The International Review of Research in Open and Distance Learning, 14*(3), 462-487.
[5] "Guidelines for Professional Development of Online Teachers." Southern Regional Education Board, March 2009. https://www.sreb.org/sites/main/files/file-attachments/04t04-standards_online_prof_dev.pdf

with technology can also limit the variety of tools used for instruction which may mean the best modality for learning the content is not employed thereby negatively affecting the quality of instruction[6,7].

FCPS Efforts. With both synchronous and asynchronous learning, teachers were expected to use variety of technology tools to support virtual instruction. Among the technology is email, FCPS 24-7 Blackboard, G Suite, Google Classroom, Blackboard Collaborate Ultra, Schoology for pilot schools and many resources from the FCPS Digital Ecosystem library. In addition, SBTS were expected to provide support and troubleshooting for teachers in using these tools and TSSpecs were responsible for supporting access through the distribution of devices as well as troubleshooting issues. FCPS provided common guidance on the use of the technology platforms as well as professional development in using the Digital Ecosystem tools. There is also a Google site (Online Learning Tech Toolbox) specifically designed to support the technology part of virtual learning. It includes a technology preparation checklist for distance learning noting what teachers need to know and be able to do to successfully navigate each platform. It also links core, grade-level, and supplemental tools from the Digital Ecosystem Library. Each tool has information on how to access it, a description of how it might be used, supporting materials to learn to use the tool, and an explicit description of where it can fit into the FCPS Learning Model. To support potential widespread use of concurrent instruction, the PD Guidebook includes guidance on how to set up needed technology as well as technology resources for each section of the guidebook.

Content

When researchers asked experts in online instruction about needed skills, they mention content expertise[8]. This is a basic competency regardless of the format for instruction. Teachers need to know their goals and learning objectives; the logical sequence of knowledge and skills students need to progress in their understanding as well as how to develop and select appropriate and varied resources that accommodate different learning styles and preferences of students. They need to know how to deliver that content online.

FCPS Efforts. As part of curriculum guides for SY20-21, FCPS defined essential learning for each subject. Some of the curriculum guides, notably elementary and middle school math and elementary language arts, include differentiation suggestions for diverse learners. But this is not yet consistent across subjects or grades. The Teaching Considerations portion of the Return to School Google site offers links to supports for advanced learners, English Learners, and students with disabilities. However, these supports to not address content.

Design

Traditionally, online course design has been the work of one teacher, but as online courses have become more complex, an emerging best practice is to use a team approach[9]. Districts pull together a team of teachers, content specialists, and technology/media specialists to collaborate. Whether it is an individual or group effort, effective course design involves understanding and applying instructional design principles, models and theories, presenting the learning materials in different formats for different types of learners and using feedback from students to improve the quality of the course[10].

FCPS Efforts. Similar to the spring, each teacher manages his/her own course, either individually or as part of a collaborative learning team. While central office provides curriculum and suggested instructional resources, it is ultimately up to each teacher to put those into designing an entire course. Based on

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[6] Hanover Research (2015, August). Best practices in K-12 online and hybrid courses. https://www.gssaweb.org/wp-content/uploads/2016/04/Best-Practices-in-K-12-Online-and-Hybrid-Courses.pdf.

[7] Albrahim, F. A. (2020). Online teaching skills and competencies. *The Turkish Online Journal of Educational Technology, 19*(1), 9-20.

[8] Bailie, J. L. (2011). Effective online instructional competencies as perceived by online university faculty and students: A sequel study. *Journal of Online Learning and Teaching*, *7*(1), 82- 89.

[9] Ibid, Hanover Research (2015).

[10] Konings, K. D., Brand-Gruwel, S., & Merrienboer, J. J. G. (2005). Towards more powerful learning environments through combining the perspectives of designers, teachers, and students. *British Journal of Educational Psychology, 75*(4), 645-660.

qualitative data gathered by the study, the majority of course/instructional design was handled by staff in schools.   Among the options for professional development teachers could attend were courses on how to set up online courses in ways that are students and family-friendly. However, it was not an expectation that teachers attend professional development in online course design. (Rating: Somewhat Addressed).

Management

Effective management of online instruction is critical to support student learning. There are the logistic aspects of management, clarifying roles and expectations, tracking course and student progress, establishing and sharing rules for behavior and participation, managing time, expectations for communication channels, and complying with legal and ethical issues. Then there are the softer skills of serving as the demonstrating leadership, management, mentoring and coaching qualities to engage students and support their progress. Some studies have emphasized instructor presence and accessibility as among the most critical of factors related to student success online[11]

FCPS Efforts. Professional development by FCPS prior to the start of school in 2020-21 included an emphasis on creating a learner-centered environment, with outcomes about creating relationships in a virtual environment, creating communication norms and routines, setting up a virtual learning classroom, creating norms to ensure in inclusive and antiracist classroom community, managing a virtual classroom, promoting digital citizenship, and orienting students and parents to the virtual environment. These all support effective management. Resources available to staff through the Return to School Google sites for both elementary and secondary include building an online community, routines and procedures in an online environment, and digital citizenship. (Rating: Somewhat Addressed).

Social/Communication

In a virtual environment, teachers need to create an environment that fosters connection and establishes channels for communication. Research indicates that creating a sense of belonging is key to student success[12].   Teachers need to be skilled at building rapport and fostering relationships between themselves and students and among students during both synchronous (during online instruction) and asynchronous (non-instructional) time using a different media. Teachers need to create an atmosphere that respects cultural difference. Communication should be open, clear, and frequent. Teachers should use different communication methods for accessibility and consider what will be best for each student[13].

FCPS Efforts. Professional development prior to the start of the year included building relationships in an online environment and there are resources for staff on building an online community and supporting families. However, there has been less emphasis since the initial classroom set up period on the importance of continuing to build a sense of connectedness and community, both within the class and with families. Without the opportunity for social interaction regularly available to students through lunch, time between classes, recess, etc. that occur naturally when school is in-person, students do not have as much time to interact informally with one another. (Rating: Fully Addressed).

Willingness to Learn

In addition to the skills listed above, a less frequently mentioned competency in the literature is a willingness to learn. When Martin and colleagues[14] asked award winning online instructors what skills they thought were necessary, willingness to learn with a focus on pedagogy and technology was the one most frequently mentioned. They noted a need to read about how best to deliver online instruction and learn new technologies. They also noted that preparing for online instruction took more time than for face-to-face

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[11] Ibid, Martin et. al. (2019).
[12] Coonin, B., Williams, B. F., and Steiner, H. (2011). Fostering library as place for distance students: best practices from two universities. Internet Reference Services Quarterly, 16(4), 149-158.
[13] Ibid, Albrahim, 2020.
[14] Martin, F., Budhrani, K., Kumar, S., & Ritzhaupt, A. (2019). Award-winning faculty online teaching practices: Roles and competencies. Online Learning, 23(1), 184-205.

classes. Awareness of the need to focus on pedagogy and technology tracks to the TPACK framework[15] developed by Mishra and Koehler (2006) to describe how integrating technology into instruction involves integrating deep content knowledge, with pedagogy, and technology. While teachers may have deep knowledge in one or more of these areas, it is the integration of the knowledge across each that is critical for quality instruction (Figure F-1).

Within both synchronous and asynchronous instruction, teachers must rely upon pedagogy, content, and technology to engage students in learning. Best instructional practices in a physical environment still apply in a virtual environment. However, teachers must have the knowledge, skills, and technology tools to transfer instructional best practices into a virtual environment. Some of this new knowledge will need to be about technology and some of this new knowledge will have to be pedagogical.

FCPS Efforts. In addition to student learning, it was also expected the adults in the system engage in their own learning to improve and adapt their skills to the new circumstances. Extra time was provided for teachers to engage in their own learning before students returned, with required coursework in building a learner-centered online environment and creating meaningful online learning experiences. Staff are expected to continue to engage in professional development, with time available to do so on Mondays. In addition, staff are expected to continue to engage in collaborative learning meetings and there are resources on the Return to School Google site for collaborative team meetings. The Concurrent Instruction: PD Guidebook also has a full section on support for collaborative teams. (Rating: Addressed)

Figure F-1: Technological, Pedagogical, Content Knowledge (TPACK) Framework
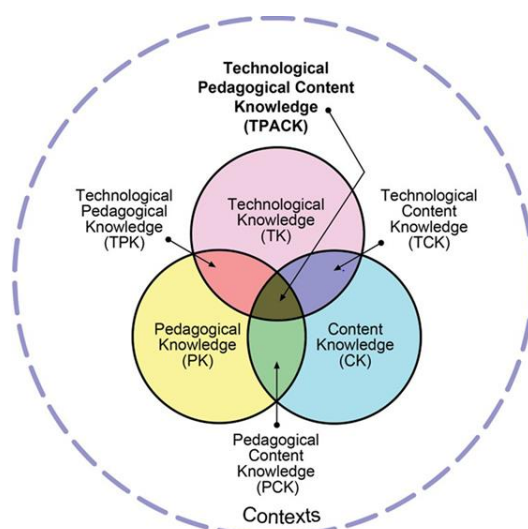
Student Self-Regulation

In a virtual environment, students need to manage and monitor their learning to be successful. Research[16] indicates that successful online learners need to be self-regulated or in the process of learning how to become self-regulated learners. Self-regulated learners use opportunities to make decisions about several aspects of their own learning. They make decisions in the goal setting, planning, monitoring and

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[15] Mishra, P. & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. Teachers College Record, 108(6), 1017-1054. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.523.3855&rep=rep1&type=pdf

[16] McLoughlin, C. and Marshall, L. (2000). Scaffolding: A model for learner support in an online teaching environment. In A. Herrmann and M.M. Kulski (Eds), Flexible Futures in Tertiary Teaching. Proceedings of the 9th Annual Teaching Learning Forum, 2-4 February 2000. Perth: Curtin University of Technology. Retrieved April 13, 2004, from: http://lsn.curtin.edu.au/tlf/tlf2000/mcloughlin2.html

assessment phases of the learning process. Self-regulated learners know how to learn, how they learn, how to reflect on their learning, how to initiate learning and how to use time management skills efficiently. Mastery of these skills enable online learners to make efficient use of their time and the available online resources[17]. As the field of distance learning has evolved from distance education to a more interactive method of learning, research continues to identify self-regulation as essential for success. Recent research[18] identified the following characteristics and skills as critical to the success of the online learner:

> Having a strong academic self-concept.
>
> Exhibiting fluency in the use of online learning technologies.
>
> Possessing interpersonal and communication skills.
>
> Understanding and valuing interaction and collaborative learning.
>
> Possessing an internal locus of control.
>
> Exhibiting self-directed learning skills.
>
> Exhibiting a need for affiliation.

FCPS Efforts. Despite the importance of explicitly teaching students self-direction and self-regulation skills needed to be successful with virtual learning, FCPS has few resources to do so. FCPS set up an expectation that students participate in social-emotional learning through morning meetings or advisory periods, but the content of these lessons is left up to the individual school or teacher. The lessons, therefore, may or may not address the critical skills needed for successful online learning. FCPS does not explicitly define expectations for how teachers can develop self-regulation skills in students who are not strong in these areas.

While teachers were required to participate in SEL professional development prior to the start of the school year, the training focused on social-emotional development and skills overall, not specifically those needed for success in virtual instruction.

The social and emotional learning component of the Return to Learn Google site includes the competencies of self-management, self-awareness and responsible decision making, with general (not online-specific) strategies for integrating skills into instruction. There are lessons available that cover a full range of SEL skills, not specifically those needed for virtual learning. (Rating: Somewhat Addressed)

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[17] Ibid, Albrahim, 2020.

[18] Dabbagh, N. (2007). The online learner: Characteristics and pedagogical implications. Contemporary Issues in Technology and Teacher Education [Online serial], 7(3). Retrieved from https://citejournal.org/volume-7/issue-3-07/general/the-online-learner-characteristics-and-pedagogical-implications