


# Virtual Learning in Fairfax County Public Schools



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## EXECUTIVE SUMMARY: Virtual Learning in Fairfax County Public Schools

The original purpose of the present study was to gather formative and summative data related to the FCPSOn initiative during its fifth year of implementation in the 2020-21 school year within Fairfax County Public Schools (FCPS). However, due to the SARS COVID-19 pandemic, data collection activities initially planned were placed on hold. The present study sought to explore the experiences and reactions of stakeholders to virtual learning over the past two years. Participants included Phase One (Chantilly Pyramid and eLearning Backpack) schools, which began FCPSOn implementation in 2017-18; Phase Two (high schools) that began implementation in 2019-20; and Phase Three (middle schools) that began implementation in 2020-21. An additional three randomly selected elementary schools were included since all elementary school students and teachers received laptops due to the pandemic and need for remote learning. A key component of FCPS' distance learning implementation included professional development (PD) in both virtual and concurrent learning environments.

### *Preparation and Implementation of Virtual and Concurrent Learning*

Virtual instruction began in the spring of 2020 and continued through the fall of 2020 with all students and teachers engaged in remote learning. Teachers reported being overwhelmed and confused by the amount of professional development offered prior to the start of the 2020-21 school year. SBTS agreed, noting the need to build teachers' technology skills quickly to support implementation. Both groups indicated that there was no clear or consistent messaging from the district regarding the preparation for virtual learning, citing shifting plans, expectations, and last-minute decisions by FCPS. Different approaches to preparation by schools, as well as variations in SBTS deployment, created inconsistencies across the district in terms of preparation and implementation. However, some teachers and SBTS acknowledged that the start of the 2020-21 school year was smoother than expected, largely due to having taught virtually in the spring of 2020, and having two extra weeks before classes began to prepare. As the school year progressed, teachers and students became more comfortable using technology, resulting in more efficient implementation and higher student engagement. Both stakeholder groups agreed that an unexpected outcome of virtual instruction was increased interaction among normally reticent or introverted students. SBTS noted that teachers "figured out" how to build community in a virtual learning environment.

Concurrent learning began in February of 2021 and by April 2021 most students were expected to return to in-person learning four days per week. Teachers reported having less time to prepare for the concurrent teaching model implementation compared with the virtual learning model and overwhelmed by the professional development provided by the district. Teachers had to learn how to navigate in a concurrent teaching classroom setting, familiarize themselves with new equipment, and create lesson plans for students in two different learning environments. SBTS' attention shifted to selecting and setting up equipment and providing subsequent training, which they themselves deemed as "not always sufficient." Despite challenges, teachers reported the ability to create interpersonal bonds with their students and students with their peers as a notable benefit to the concurrent model. It also became easier to support students who may have been struggling in the virtual learning environment.

In addition to previously mentioned challenges to virtual and concurrent learning, teachers and SBTS expressed concern that issues with access and equity were exacerbated by the pandemic. Insufficient Internet access continued to plague certain student populations, often dependent on the number of home users or where a student lived. In addition, students living in home environments that were not supportive of their learning were at a notable disadvantage compared to peers who had more stable living conditions.

### *Tech Use and Instructional Practice*

Teachers and SBTS alike reported that teacher awareness of digital tools increased as they used tech-based resources they might not have otherwise accessed. The pervasive use of technology for instruction during both remote learning models forced teachers to become more accepting of tech use and learn how to adapt their teaching styles to incorporate digital tools. Both groups acknowledged positive changes to instruction as becoming more student centered, where students were no longer simply consumers of technology. Both stakeholder groups noted that through the increased use of technology teachers were able to deliver more differentiated lessons to their students, as well as provide instantaneous feedback. However, teachers expressed concern about the negative impact on assessment, noting the inadequacies of summative online assessment tools, having to rely on short, multiple-choice questions, and the issue of academic integrity.

Both stakeholder groups agree that peer-to-peer sharing and support is a much desired and effective method of delivering professional development to inform instructional practice. "Time" was perhaps the most frequently mentioned need for professional learning: time to absorb, reflect, practice, and receive feedback. Teachers want more focused professional development and not be required to sift through a multitude of offerings. They seek grade and content level-specific training, and want more input into PD offerings. More SBTS and tech support is needed. Teachers and

SBTS agree that FCPS support is needed to maintain and upgrade existing hardware, including providing reliable Internet access.

### *Future Use of Technology and Instruction*

Participants agreed regarding the necessity of technology in education and can provide limitless possibilities related to preparation for 21<sup>st</sup> century jobs, opportunities for creativity, flexibility, and independence, as well as personalized learning. The use of technology provides teachers with the tools to differentiate instruction for special populations of students. Teachers are no longer limited to what is contained within the four walls of their classrooms and, instead, see technology as providing a window on the world and opportunity for exposure to different cultures, content experts, and virtual experiences. As a teaching and learning tool, technology encourages collaboration and interactivity among teachers and students alike. Technology use in instruction can provide students with more options for expression and creativity. However, both groups of stakeholders stressed that technology is not effective when used as a replacement for activities done by hand, such as worksheets, or as a time filler during the day-to-day routine. Teachers and SBTS voiced concern regarding inappropriate use of technology, such as the gamification of learning. Both groups caution that there needs to be a balance between technology use and more traditional methods of delivering instruction and measuring student knowledge.

### *Conclusion*

The present findings from schools indicate that stakeholders successfully adapted to teaching in a virtual learning environment, but not without having to overcome immense obstacles. Teachers and students became more comfortable overall with virtual instruction leading to more efficient content delivery. SBTS agreed that teachers became more tech literate out of necessity, which positively impacted their instruction. Differences in preparation appeared at the school level as reported by participants. These variations impacted teachers' sense of preparedness and ability to implement instruction.

As reported by both groups of stakeholders, some students thrived in the virtual environment, becoming more engaged and responsible for their learning. Students' tech skills also improved, and many gained important skills they will need to succeed in the future. Student creativity and engagement in self-guided learning were highlighted as successes by participants. Access to a personal device addressed the district's focus on equity, but connectivity issues continued to thwart those efforts among students of certain populations.

Based on the findings presented in this report, the following recommendations are offered for improving technology integration:

- **Professional development:** Provide more professional development on technology use in general, though allow teacher input into most valued or necessary topics. Consider offering grade- or content-level specific PD, encourage peer-to-peer collaboration, time for teachers to practice new digital tools over time.
- **Ongoing support:** Create a repository of training materials and continue to support the SBTS role as a resource for technology integration. Provide increased tech support in schools, support for maintenance and upgrades to existing hardware, and improve Internet access in schools.
- **Tech skill development.** Invest in teacher proficiency in Schoology; increase students' digital literacy through mandatory computer skills courses that address typing and basic troubleshooting skills, as well as digital citizenship and academic integrity.

## Virtual Learning in Fairfax County Public Schools

The original purpose of the present study was to gather formative and summative data related to the FCPSOn initiative during its fifth year of implementation in the 2020-21 school year within Fairfax County Public Schools (FCPS). However, due to the SARS COVID-19 pandemic, data collection activities initially planned were placed on hold. The present study sought to explore stakeholders' experiences and reactions to instruction during the past two years in which schools participated in virtual, then concurrent learning. This study documents virtual learning implementation in Phase One, Two, and Three schools, plus three randomly selected elementary schools, and stakeholder feedback for future FCPSOn schools. A key component of FCPS' virtual learning includes professional development (PD) in both virtual and concurrent learning environments.

Sixty schools in Fairfax County Public Schools comprise Phases One through Three of the FCPSOn initiative. These schools include all nine schools in Chantilly Pyramid, 27 high schools, and 24 middle schools throughout the district. The original plan of phased-in laptop distribution was replaced by districtwide device distribution necessitated by the pandemic and need to implement virtual learning in the spring of the 2019-20 school year. Professional development was provided by the district during the following summer in preparation for the 2020-21 school year. PD by FCPS supported teachers' efforts to integrate technology in an all-virtual learning environment, including the use of learning management systems, as well as digital platforms for delivery of curriculum. Teachers were further supported by the district through delivery of additional hardware, such as cameras, microphones, and monitors.

The present evaluation examined components of the virtual learning environment, including the impact of the PD offered to teachers on virtual and concurrent learning models. The following evaluation questions guided the current research:

1. How do stakeholders view their changes in instruction over the past two years (virtual and then concurrent models)?
  - a. What has gone well and what was challenging?
  - b. To what extent have various professional learning opportunities and supports (e.g., ISTE Academy, Webinars) impacted instruction?
  - c. What supports are needed to continue positive instructional practices?
2. What are stakeholders' views on technology and learning within their classrooms going forward?
  - a. What practices do stakeholders want to continue or grow?
  - b. What practices do stakeholders see as not continuing?

## Method

## Research Design

The current qualitative study includes data collected from teachers and school-based technology specialists (SBTSs) through phone or Zoom-based interviews. Interviews were conducted over approximately six weeks, beginning in June of 2021 and concluding in mid-July.

## Participants

In the 2020-21 school year, 60 schools comprised Phase One, Two, and Three of FCPSOn, the district's phased-in 1:1 device initiative. These included nine schools in the Chantilly Pyramid, 27 high schools, and 24 middle schools throughout the district.

However, due to the pandemic, all students were required to receive a device, including at the elementary level. CRRE randomly selected 40 schools from the 60 in Phases One through Three, plus three randomly selected elementary schools, as the sampling pool for teachers and school-based technology staff as participants. Content area teachers and SBTS from randomly selected schools were sent an introductory email by FCPS describing the data collection activity, which included an invitation to access a Doodle poll and schedule an interview. The goal was to complete interviews by the last day of the school year, June 13, 2021. A subset of teachers who attended the ISTE Academy, identified by FCPS, was also included in the sample. Following the initial request, two follow-up emails were sent in an effort to increase the sample size and complete the interviews by June 13, 2021. Due to a somewhat low response, FCPS then provided CRRE with contact information for teachers working on curriculum development beyond the end of June, and this group received the same email invitation and request to complete a Doodle poll to schedule an interview. This outreach yielded an additional 24 teachers, including 10 who had also received the ISTE training, who were included in the overall sample.

Interviews were conducted with a total of 58 teachers and 12 SBTS. Of those teachers interviewed, a small number ( $n = 16$ ) attended ISTE training. Table 1 provides details on the teacher participants.

Table 1

### *Description of teacher interview sample (2020-21)*

	1-3	Second	Third	Fourth	Fifth	Sixth	Other	Total
Elementary Teachers	3	1	1	5	0	3	5 <sup>1</sup>	18
	ESOL	Math	WL	Soc Studies	Science	English	Other	
Middle School Teachers	3	2	0	5	2	5	1	18



High School Teachers (eLB)	1	0	0	1	1	1	0	4
High School Teachers (CP)	0	0	0	1	0	0	1	2
High School Teachers	0	1	2	7	4	3	0	17
Total								59 <sup>2</sup>

<sup>1</sup> Other includes one reading specialist, resource teachers for G/T and math, advanced academics, and STEAM.

<sup>2</sup> One ESOL teacher is counted twice because they also teach in a core content classroom.

## Measures

The data source reported on in the current report includes phone or Zoom-based interviews with teachers and school-based technology specialists.

**SBTs interviews.** Twenty SBTs were randomly selected for an interview; however, only 12 responded to multiple requests. SBTs represented three elementary, three middle, and six high schools. An interview protocol (see Appendix A) provided the opportunity for SBTs to describe their experiences and perceptions of the implementation of the virtual and concurrent learning environments. Interviews with SBTs lasted approximately 45 minutes and were conducted by phone or Zoom in June of 2021.

**Teacher interviews.** In an effort to cause as little disruption to schools as possible, teachers were randomly selected for virtual/phone interviews. Interviews lasted approximately 45 minutes. The interview protocol (see Appendix B) solicited teachers' descriptions of and reactions to changes in their instructional practice, professional development offered prior to and during the 2020-21 school year, including training on both virtual and concurrent learning implementation, benefits and drawbacks of technology use, and the future of technology integration into their teaching practice.

## Analytical Approach

All qualitative data were analyzed using a grounded theory approach (Glaser & Strauss, 1967). Recorded data were transcribed, organized and then analyzed using an iterative coding process. A structure of codes emerged from patterns in participant responses. All codes were consistently reviewed for uniqueness and cohesion. The qualitative findings reported on in the current report are themes which emerged prominently from interviews with teachers and SBTs.

## Results

In this section we present findings regarding teacher and SBTS perceptions of their experience in the 2020-21 school year. We begin with participants' background, which is followed by experiences in a virtual learning environment and then concurrent learning environment. We then present stakeholders' reactions and experiences to changes in instructional practices.

### *Background and Experience*

Teachers were first asked to describe their teaching experience, which ranged from 1 to 40 years. The majority ( $n = 12$ ; 21%) had been teaching for nine years; 12% ( $n = 7$ ) had 8 years' experience; 10% ( $n = 6$ ) had 6 years' experience. The 12 SBTS interviewed had between 1 and 13 years' experience, with a 10.3 year average number of total years in this role.

Teachers were asked to describe their experience using technology in their instruction and reported a wide variety of technology use, best described as low (25.9%), medium (24.1%), high (41.4%), or extensive (8.6%). The majority of those with high levels of experience described themselves as being "very comfortable and experienced using tech." Many were in 1:1 schools prior to the pandemic, and others were on their school tech team. Medium users considered themselves "familiar" or "intermediate" noting experience primarily using Google Classroom and smart boards. The low group described tech use as limited to presentations, websites, and laptop carts. One teacher admitted to not being the most comfortable saying, "I'm definitely a technology immigrant, not a technology native." Extensive users were previously employed in a technology field or used technology extensively in previous jobs prior to becoming educators. The extensive group included two who were teachers in the FCPS online campus virtual high school.

SBTS were asked to describe their school's experience in using technology in instruction. Some SBTS interpreted this question to focus on their school's experience using technology in instruction right *before* the COVID pandemic began, others interpreted the question as asking about their school's current usage, and others described their school's trajectory in recent years. Most SBTS (82%) who responded to this question indicated that their school was at a good place or had momentum with regard to technology, which two attributed to their experience with FCPSOn and which another attributed to her school being well-resourced thanks to their Parent Teacher Organization. One SBTS commented, "we were in a pretty good place" when the pandemic hit. Another said, "when COVID hit, we were so thankful that we already had infrastructure in place for the students and the teachers." Another SBTS felt "kind of blessed" that before the pandemic this person had worked with the school staff on blended learning tools and integrating technology "without it driving the lesson" and that two-thirds of the staff were "pretty comfortable" with technology. Another SBTS reported that since the end of the official FCPSOn training, the school has been heavily invested in blended learning and that it had not been difficult for teachers to adopt

technology, although the transition to newer tools and managing an all virtual space had been harder. The other two SBTS reported that teachers used technology some, but that levels of usage varied.

Both groups of respondents were asked to describe the model(s) of instruction they experienced in their school during the 2020-21 school year. Of the 58 teachers who were interviewed, more than half (55%) initially taught using the virtual model from the start of the 2020-21 school year until approximately February of 2021. At this time the concurrent model began, with half their students in person two days per week while half remained at home and then each group alternated days. Monday remained an asynchronous day for teacher planning. A few teachers (19%) reported teaching virtually the entire year, some with the support of a co-teacher or classroom monitor who was physically in the classroom. In addition, a handful of teachers taught in various combinations of the virtual and concurrent models: some were part of a concurrent teaching pilot and returned to school in November, those who elected to teach virtually from their school for personal reasons, and specialists who continued to teach virtually while in the building even after students began returning to school in February.

All SBTS interviewed indicated that their schools had started with a virtual format and then became concurrent. Three SBTS (one each from elementary, middle, and high schools) indicated that late in the year students had the option to be in person four days per week, and a fourth SBTS indicated that this was true for kindergarten through 4th grade while 5th and 6th grade remained concurrent. For most if not all schools, Monday was a virtual asynchronous day for all students all year long.

### *Virtual Learning Experiences*

On September 8, 2020, FCPS began synchronous, virtual instruction for all students providing four days of live, face-to-face online instruction with teachers. Mondays were asynchronous to allow teacher planning time. During interviews, teachers and SBTS were prompted to discuss the startup and implementation of virtual learning, then how implementation may have changed over time. They then discussed successes and challenges of teaching and learning in a virtual environment.

**Initiation of virtual learning.** When describing the startup of virtual learning, in a word, teachers described it as “hard.” They recounted feeling confused and overwhelmed by the amount of training and resources made available by FCPS as “a lot of information flying at us, changing every day.” Teachers reported extensive training on new platforms, such as Blackboard Collaborate Ultra and Schoology, as well as new instructional applications, like Pear Deck. While some teachers appreciated the available resources, others reported being inundated with resources that they had to “ferret” through, without a clear understanding of what would work best for them in their classrooms. Teachers’ preference was to have the ability to practice with the new

technologies and applications, learning through trial and error, before choosing which programs to use. Many teachers (43%) reported being required to adapt their materials for digital learning prior to the start of the school year, which they frequently described as being extremely time consuming. A minority (17%) of participants reported finding professional development resources on their own that were more focused on specific instructional needs, like online simulations, or sharing resources with collaborative teaching teams in their respective schools. Adapting materials, learning new platforms and online tools, becoming familiar with new hardware, and setting up a home teaching environment led to a stressful start to the new school year.

All was not entirely negative, however. Several teachers (38%) noted that having experienced virtual instruction in the spring of 2020, along with the extra two weeks to prepare before the start of the school year, led to a smoother transition to virtual instruction than might have been expected. Teachers reported feeling at least somewhat prepared and ready to “hit the ground running.” Additionally, a handful of teachers described extra support being provided by their school’s SBTS, as well as “tech savvy” classroom teachers, as contributing to their preparation for virtual instruction.

SBTS concurred that starting the school year was hard, but less hard than it would have been without past experience using technology to teach. Many SBTS interviewed (42%) described the very beginning of the year as tumultuous and difficult, with descriptions including “really rushed and rocky,” “a little crazy,” and “we were all kind of running [...] like chickens with our heads cut off,” and two of these SBTS also mentioned the challenge posed by shifting plans and expectations. Another SBTS explained that teachers were in survival mode. Roughly a third of SBTS explicitly said that a lot of work was required of them to start up virtual learning in the 2020-21 school year, and one of these noted that hard work was required of teachers, administrators, students, and parents too. Even so, a quarter of respondents noted that their schools benefited from the foundational skills they had developed through FCPSOn and/or virtual learning during the spring of 2020.

Building teachers’ skills was an important part of SBTS work to start up virtual learning in the 2020-21 school year – helping them with the “creation of their learning environments,” as one SBTS put it. Many SBTS (50%) described training that was provided for teachers by their school and/or by FCPS. Several (25%) indicated they provided one-to-one assistance to teachers regarding set-up, training, and/or troubleshooting. Two SBTS (17%) mentioned teacher collaboration, and one of these SBTS noted that their school had designated and trained a team of teacher-leaders to become peer experts in the use of technology for virtual learning. One SBTS noted that their school leaders felt that learning BCCU was “enough” and were intentional about not overwhelming teachers with too many additional tools.

Several SBTS mentioned the specific platforms and/or applications their schools used for virtual learning. One SBTS reported that their school launched Schoology. Two

SBTS (17%) indicated that teachers could use Google or BBCU, a quarter indicated that all teachers were expected to use BBCU. Other SBTS referred to BBCU and/or Google without indicating whether their usage was universal and/or required at their school. One SBTS reported getting licenses for specific applications, and another referred to specific tools (besides Schoology, BBCU, or Google) that their teachers used. One SBTS indicated that their school emphasized consistency in how technology tools were used to create a consistent student experience across classes.

Some SBTS (25%) interviewed indicated that their school focused on building community, and two of these SBTS indicated that their school focused on students' social-emotional learning as well, and one of these SBTS reported that teachers were asked to let administrators know which students were not attending class so that they could reach out to them. Two SBTS (17%) also described efforts to communicate with and train parents and students on the technology.

**Changes in implementation.** Several teachers (34%) reported that virtual learning implementation changed as a result of trial and error and finding what technologies worked best for their instruction and students. Perhaps not coincidentally, a similar number of teachers noted that as they became more comfortable using technology, it became easier to deliver instruction online. One teacher reported administering an engagement survey for students to rate the digital tools they were using and how they engaged with each. Teachers reported that students became more adept at using the various platforms, which contributed to virtual instruction becoming more efficient because teachers were not spending as much time trying to fix technical issues, like the sound not working, or students accidentally logging off. As both teachers and students settled into the virtual learning routine, a few (14%) teachers reported experimenting with adding new features, like breakout rooms, as well as more slides, games, and applications to increase interactivity. One teacher noted that implementation improved "significantly" with the addition of breakout rooms, a larger grid to see all students, polling, and hand raising functionality. Another teacher added Go Formative for students to record themselves, providing her with more time for class instruction. Other teachers conducted more check-ins with students to gauge what was working or not working, allowing them to continuously reassess their approach to keeping students engaged.

However, a few teachers (10%) also reported having to reduce content and modify pacing guides due, in part, to shortened instructional time. Impacts on instructional time varied but included the amount of time spent having students log in, slow internet, or students not having updated their computers. The need to conduct additional check-ins to see who was online and who was not also influenced teachers' ability to deliver planned lessons. As one teacher noted, the amount of time to do anything was "tripled." Another stated that lessons had to be simplified and repetitive so that expectations were clear. Further, some teachers reported limiting the use/number of applications so as not to overwhelm their students.

Teachers reported that implementation changed as they attempted to create a “normal” classroom environment and establish regular teaching routines to improve participation, while trying to find the right tech tools for the job. This, at times, meant using less technology like a simple Google doc versus the variety of available applications. Additionally, some teachers (roughly 20%) reported that virtual instruction caused them to change their teaching style by limiting the use of lectures, having students do homework during class time, and relying more on the chat feature so that students could quickly reply to short-answer type questions. Teachers also reported limiting assignments and testing, shortening assessments, and/or no longer using multiple choice/memorization type assessments. Instead, one teacher reported using other tools to measure student mastery, such as conducting authentic research, collaborating within a team, and creating a website. A smaller number (5%) reported no change to their implementation over time.

Overall, the SBTS indicated improvement over the course of virtual instruction. Many (50%) indicated that teachers’ comfort with virtual instruction increased, including what one described as the “air traffic control<sup>3</sup>” required. About a quarter reported that instruction became smoother. Most SBTS (58%) described improvement to the quality of instruction, such as increased use of breakout rooms, more attention to student engagement and interaction, more creativity, and/or more use of tools to see students’ work. In addition, one SBTS described an increase in student engagement once students became accustomed to virtual instruction, and a quarter noted that there was considerable or increased collaboration among teachers.

**Virtual learning successes.** Several teachers (38%) reported having a positive experience using helpful online tools as contributing factors to their successful virtual implementation. They tried new online tools that would not otherwise have been attempted, and noted significantly increased teacher and student resilience in a challenging environment. The variety of applications made learning less boring, and the use of digital games added an element of fun. In addition, access to a variety of programs and increased use of visual materials made engagement activities more interesting for students overall. Encouraging feedback included:

- **Technology to support engagement.** Interactive applications that provided anonymity, like Pear Deck, increased student participation; the anonymous nature of chat and access to instant feedback encouraged higher student engagement. Online simulation tools replaced hands-on lab experiments. Breakout rooms enhanced collaboration, team building, and engagement.
- **Assessments.** Applications such as Kahoot were used successfully for review, formative and summative assessment, and assessment became easier with the use of automatic grading tools.

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<sup>3</sup> Managing the various input streams (chat/message, e-mail, questions and concerns students express out loud, requests for troubleshooting IT issues), while trying to provide instruction or lead a discussion.

- **Relationship building.** Student-teacher bonding occurred via chat, which was critical in providing social-emotional and motivational support.
- **Flexibility of instruction.** Recorded lessons provided access to students who missed a lesson or needed to review the material, enabling students to work more independently and at their own pace. Self-motivated students also benefitted from the virtual learning format.
- **Collaboration.** Planning among teachers improved, particularly among teachers with specific student populations, such as English language learners. Teachers worked in collaborative learning teams, and tech-savvy teacher leaders assisted their peers.
- **Time management.** Team meetings were reportedly more efficient.
- **Classroom management.** Teachers were better able control talking/chatting by muting students. There were fewer distractions in the virtual context.

All of the SBTS interviewed unequivocally identified things that had gone well during virtual learning. One SBTS pointed out that virtual learning

*...provided an ability that we would not have had five or ten years ago to actually continue education [during the pandemic]. As much of a struggle as it was, [...] it just felt normal to be kind of in classes and having a schedule.*

Positive feedback was similarly reported:

- **Technology in support of instructional practice.** Instruction was more student-centered; teachers applied more attention to lesson planning and produced better lessons. Teachers able to see student work in real time through apps like Google Docs or Pear Deck. More formative assessments and less reliance on summative assessment occurred. Student growth was evident, even if not as much as in other years.
- **Student collaboration.** Interactivity, shared documents, and breakout groups were observed.
- **Tech skills.** Teachers built their knowledge, skills, and independence or resilience in using/troubleshooting technology.
- **Choice PD.** Teachers' opportunity to select PD of relevance and value to them was successful.

**Virtual learning challenges.** On the other hand, when asked what was challenging in using a virtual learning format, a majority of teachers (60%) replied that engagement, participation, and time management were overwhelmingly challenging when teaching in the virtual format. Maintaining student engagement was reported to be especially difficult among at-risk students, more introverted students, students who

struggled with motivation, or had special needs. As one teacher stated, "Engagement of students was not only difficult, but often impossible without physical presence."

Another teacher put it this way:

*The biggest challenge is that I couldn't help individual students very well. And that is particularly true in writing instruction, like, couldn't sit down and conference with a student about their writing. That was really difficult. I could have a student ask questions in the chat, which was great. But if I knew a student was struggling, I could ask them questions all day long in the chat, but they wouldn't respond. But in person, I could go over and I could sit by them. And I could say, hey, let me help you. And they can't ignore me, you know, but in the chat, they don't have to respond.*

Roughly half (58%) of SBTS agreed that student engagement was the most frequently observed challenge of the virtual learning environment.

Additional challenges recorded include:

- **Increased workload.** Additional instructional planning was required; students often missed directions or needed more explicit instruction, causing lessons to be more repetitive and time-consuming. Teachers had to teach students new programs and apps while also learning them themselves. SBTS' workload was exacerbated by the challenge of delivering online PD and increased need for tech support.
- **No microphones or cameras.** Struggling students could not be redirected when their faces were not visible. Lack of video or audio hurt classroom cohesiveness, challenged relationship building, and inhibited online discussion. "Ghosting" by students who logged in but then disappeared made it impossible to know who was present.
- **Limitations of technology.** Access to breakout rooms was limited, restricting teachers' ability to hear all student responses; no gallery view in BBCU. Unreliable Internet access and/or tech issues introduced "a new level of inequity." Students did not update computers, struggled with slow to load programs, and did not always have a parent available to assist with tech glitches.
- **No hands-on materials.** Students lacked hands-on manipulatives and teachers were unable to produce in-class simulations or experiments. Lack of physical books made teaching reading and writing more difficult.
- **Special population needs.** Virtual instruction made it difficult to provide special services such as speech therapy and special education, or to meet the needs of SPED and ESOL student populations.



- **Increased social-emotional issues.** Students were overwhelmed by workload and having to learn new learning systems and applications; students' inability to collaborate or be with their friends exacerbated social-emotional issues.
- **Home environment.** Some students struggled where home environments were not conducive to learning, had increased levels of distraction, limited space for an appropriate learning environment, or who might have been in a daycare setting. No separation between home and school made it difficult for both students and teachers to fully disengage from school/work outside of normal school hours.
- **Academic integrity.** Cheating and no accountability (e.g., inability of teachers to monitor student effort), specifically related to assessment, resulted in some assessments being switched to multiple choice tests for efficiency, at the expense of demonstrating student understanding. Teachers could not definitively identify who was taking a test and suspected parental involvement in some cases.
- **Constantly changing FCPS procedures.** No clear direction from FCPS hampered efforts for consistency. Parental engagement was impacted, possibly attributed to language barriers and not being able to call from a familiar school phone number, or the difficulty for parents in keeping up with changing policies or the "firehose of communications."

### *Concurrent Learning Experiences*

In February 2021, FCPS began implementing the concurrent learning model at the high school and career and tech education levels. Lower grades and SPED students were gradually included in this teaching approach. By mid-March, all who had requested face-to-face instruction were enrolled in the concurrent model for two days a week, with half of students learning in-person while the other half remained virtual on alternating days. By April, all students were eligible to return to in-person instruction four days per week. During interviews, teachers and SBTS were prompted to discuss the startup and implementation of concurrent learning and how implementation may have changed over time. Finally, participants discussed successes and challenges of teaching and learning in the concurrent model.

**Initiation of concurrent learning.** In terms of startup and initial implementation of concurrent learning, teachers variously described it as "Just a hot mess," "It was the worst of both worlds," challenging, frustrating, and "daunting." Several (26%) reported receiving little to no training, while others (31%) wanted more guidance and time to practice. Teachers reported a lack of specific instruction on how to implement concurrent learning, being given a lot of "stuff" with no time to digest it, and being told to "just roll with it," while figuring things out on their own. A few teachers noted receiving less support for concurrent preparation compared to what was

provided prior to launching virtual instruction. As with the overwhelming amount of resources for virtual learning, teachers described receiving so much information on concurrent teaching that they did not have time to process much of it before instruction began. One teacher described useful training on different concurrent models, such as station rotation, classroom setup, and classroom management. However, another teacher labelled the concurrent training handbook as “unrealistic,” stating that the strategies did not seem like they were designed by anyone who had been in a classroom, and described training as watching a 60-slide PowerPoint presentation. Still another teacher pointed out that the actual teaching practice did not work anything like the models presented in training. However, a few teachers shared that colleagues in their respective schools worked on the concurrent teaching pilot, and these teachers provided tips and tricks in support of their training.

Teachers reported having one or two days in some schools (or up to one week in others) to set up their classrooms, learn new technical equipment, create assignments, and answer emails, all while participating in professional development, which was delivered virtually. Frequent schedule changes and a lack of explicit communication from FCPS regarding concurrent teaching were cited as additional stressors. One teacher explained his ambivalence about concurrent instruction partly due to his frustration that teachers were being asked to do one more thing: “To be honest, I just felt like it wasn’t fair for the county to have us teach another way after having us learn three other learning systems in one school year.” (The three LMS referred to are Blackboard Collaborate Ultra, Schoology, and Google Classroom).

A third of teachers (33%) next described receiving new technical equipment, such as webcams and microphones, and the subsequent set-up and training on the equipment as part of the startup to concurrent teaching. An additional few described persistent troubleshooting to make sure all equipment was working properly. While one teacher reported no IT support, others highlighted the support they received from the school’s SBTS or teacher members of the school’s tech team. One SBTS hosted a “day as a student” session which a teacher said was helpful in learning how to facilitate discussion both in-person and online.

Not having experienced concurrent learning previously, teachers could not anticipate what was required to teach in that format. According to one teacher,

*I think for a lot of us, until we hit the ground running, we just didn't know what to expect. So there was a lot of it kind of felt like blind leading the blind, as well as just be flexible and run with it.*

Teachers likened implementation of the concurrent teaching model to the first day of school, including having to rewrite classroom rules for two sets of students. Others described the startup as requiring much more planning and preparation, having to teach while learning the new technology, and basically doubling their workload.

Teachers were required to balance instruction between students in two different learning environments, resulting in increased repetition and “double” teaching. As a result, a handful of teachers continued teaching in the virtual format, primarily because the number of students who returned to their classroom was so low, or the number would change on a daily basis, depending on whether or not the in-person students showed up. One teacher summed up the implementation of the concurrent model this way:

*[We] would have been better off to acknowledge the limitations of both models and be the best possible with one or the other; instead ended up being mediocre at both.*

On a positive note, a few teachers recognized that implementation went about as well as it could, with one stating, “The startup was better than I thought it would be.” Another summed it up this way: “It’s not necessarily the fault of Fairfax County; it’s like we’re building the plane while flying it.”

An important part of starting up concurrent learning described by many SBTS (42%) was setting up equipment for teachers to use. A third of SBTS interviewed explicitly described equipment purchases (e.g., cameras, second monitors, docking stations), with two explicitly referencing CARES funds. Interestingly, one school purchased the same equipment for all classrooms for ease in communicating and moving between classrooms, while two others differentiated purchases for particular classroom needs, such as purchasing the specific equipment the SBTS felt would be best for teachers in each content area. For example, science and math teachers got cameras with movable necks, so that in science the teacher could position the camera to show a demonstration, or in math the teacher could position the camera to focus on the teacher working at the whiteboard. In social studies and English, teachers received cameras designed for conferencing, so that there could be a discussion involving students in the classroom and online.

Roughly half of SBTS (58%) mentioned their role in training and supporting teachers in concurrent teaching, whether through one-to-one support, face-to-face PD, asynchronous videos, or live virtual training sessions. Much of the support was tailored to individual teachers’ needs; as one SBTS explained, “Wherever you’re at is what I’m going to support.” But according to another SBTS, even all the training and support was not sufficient to “alleviate [teachers’] nerves with having to work with so much equipment,” especially with so many mitigation strategies that they also had to monitor. This SBTS said that it was an “overwhelming” amount for a teacher to remember to do, while another noted that a lot of time and effort were required for set-up. Another SBTS personally seemed to find start-up particularly demanding:

*Myself and my TSPEC were in those classrooms every minute of every day, being visible and available to them, because we needed to make sure that they felt*

*supported. It was exhausting, I don't know that I've ever been that tired in my entire life, and I'm not the teacher of the classroom.*

In addition to SBTS' role in supporting teachers, two SBTS (17%) also noted the importance of teachers and administrators working together to develop ideas for what concurrent learning could look like, especially since, as one SBTS put it, there were "no experts." Some SBTS (25%) indicated that teachers at their school practiced teaching with the concurrent set-up, perhaps with a limited number of "practice students" in the room, before students returned to school for concurrent learning. One of these schools also held concurrent staff meetings so that teachers could experience what it would be like for students during concurrent learning.

Some SBTS (25%) indicated that, either initially or throughout that phase, concurrent learning essentially looked the same as virtual learning just with students in the classroom. In fact, one school encouraged teachers to initially use the concurrent setup to teach the same way they had virtually and, once they got comfortable with the technology, only then to start differentiating for in-person and remote students. One SBTS noted that there were not a lot of models of concurrent learning for them to learn from. Two SBTS (17%) noted that students at school could not be on BCCU because of bandwidth limitations, although these limitations were not as significant as some SBTS had been told to expect. Related to the continued virtual-style teaching, two SBTS (17%) commented on the difficulty of teaching and attending to two groups of students simultaneously. Another SBTS noted that their school encouraged teachers to focus on building culture and community in the newly configured concurrent classroom.

Despite the challenges, a quarter of SBTS explicitly described implementation as fairly successful. As one SBTS explained, "Implementation could have been so much rockier and it really wasn't – teachers have already adapted so much." That said, one SBTS did comment that teachers found it frustrating to have to shift to concurrent after figuring out how to teach effectively virtually.

**Changes in implementation.** When asked about how concurrent implementation changed over time, several teachers (36%) reported no change to their implementation, explaining that they basically continued teaching in a virtual format. This was due to a number of reasons, primarily that the number of students who returned to the classroom was very low and often inconsistent. Rather than creating two lesson plans for two distinct groups of students, these teachers taught everyone in virtual mode. As one teacher noted, "The format stayed the same. We just found more ways to be efficient."

Similar to virtual implementation, a few teachers (21%) noted that as they became more comfortable with the technology, the concurrent model actually became easier to implement. Confidence increased for both teachers and students in their use of the technology, enabling teachers to better manage two learning environments while

becoming more adept at implementing different activities. Students also became more proficient in using technology. Changes to instructional practice included increased use of breakout rooms and interactive applications like Newsela and Pear Deck. A handful of teachers had in-person students revert to using paper and pencil. Other changes noted by one or two teachers included assigning less group work, simplifying their lessons, having students complete homework during class time, limiting the use of chat (forcing virtual students to turn on their mics), assigning more independent work, and increasing the use of manipulatives for online students.

Many SBTS (50%) reported that teachers became increasingly comfortable and fluent with concurrent instruction, including three SBTS who noted that teachers also began circulating the classroom more. One SBTS noted that substitute teachers became more confident as well. With regard to specific improvements to instruction, two SBTS (17%) reported increased interactivity, including the use of interactive tools like Pear Deck and Google Docs and/or improved discussion and collaboration among students. One SBTS reported that as teachers became more comfortable, they differentiated more for location (i.e., students who were at home and those who were at school). Another SBTS observed that at first it was harder to engage the in-person students, whereas later it became harder to engage the virtual students because they felt “disconnected.” Two SBTS (17%) noted that teachers began to have students at school log onto BBCU once it became apparent that bandwidth limitations were not as significant as had been thought.

However, a quarter of SBTS said that implementation in concurrent learning did not change much over time. One of these SBTS explained, “If we had said we’re gonna be doing this again next year, then we probably would have looked at ways to improve it;” as it was, though, “we just concentrated on getting through the end of the year.” Another commented, “Most teachers experimented for maybe a few hours around what’s comfortable to them. That was it and they did not revisit it.”

Two SBTS (17%) commented on changes in the SBTS role over the course of concurrent learning. One said that the SBTS’ role became largely tech support – reactionary as opposed to proactive – and felt detached, although the SBTS did continue to provide tips and how-to videos. The other said,

*There were times where I really stopped hearing about any issues. And then I would be...out in the halls and then hear staff complaining. And I would say, 'Well, I haven't heard anything. So I presume that things are going well.' But they built that community virtually where they relied so heavily on each other for instruction resources, they weren't reaching out to me necessarily.*

**Concurrent learning successes.** In describing what went well using the concurrent learning format, teachers and SBTS alike noted the ability to make interpersonal connections with students as highly successful. Seeing students’ faces and

the ability to interact with them in-person was the most frequent response from teachers, and SBTS agreed. This sentiment was simply put by one teacher who said, "It was a joy to have kids in front of you." Another teacher said, "We're finally getting the work done...I felt like I was really teaching again." One SBTS commented, "The best part was teachers started smiling again because they had students in class. You could see they were starting to feel more themselves." Other notable successes included:

- **Technology to support engagement.** Technology was utilized more advantageously while teaching two different learner groups; concurrent teaching tools and/or technology were used more effectively for student learning. Student collaboration was fostered across distance, opportunities for student choice were created. In-person students were able to participate in or view experiments and primary sources.
- **Student collaboration/engagement.** Student interaction improved for in-person students, facilitated by small group interaction, having lunch together, and recess. Increased participation and engagement occurred for in-person students, who received more attention, had more access to classroom resources, such as hands-on materials, as well as access to intervention pullouts from specialists.
- **Instructional/social-emotional support.** Struggling students' needs were more readily identified and addressed through individualized instruction for in-person students, resulting in a "noticeable" increase in student achievement for those attending in person. Improvement in student social-emotional well-being was reported.
- **In-person benefits.** There were fewer distractions for in-person students, many of whom benefitted from being in a more structured school environment. Seeing student work, especially on assessments, was another benefit.

**Concurrent learning challenges.** There were many reported challenges to the concurrent learning format. More than half of teachers (55%) and half of SBTS (50%) reported the greatest challenge of the concurrent learning format was dividing attention between two groups of students. Teachers admitted that the students sitting in front of them received more of their attention, to the detriment of the students who remained online. A number of them stated that the quality of instruction went down for everyone using the format, that it was "impossible" to teach students in two environments, and that it introduced a new level of inequity in instruction. One teacher admitted,

*Instead of giving 100% to my students, I was giving 50% of myself to a group of students because I was required to teach two classes. And even though the content was the same, the delivery was very different. I definitely felt as though the virtual students were absolutely neglected in the sense that they just didn't have access to the same environment that in-person students [had].*

- **Ineffective instructional model.** Participants noted that the concurrent teaching model was not effective and did not work well for either group of students (virtual or in person), as compared to the virtual mode. Coordination with a classroom monitor was difficult for teachers who remained virtual, especially if the monitor was not from the teaching field. Concurrent teaching was also confusing for parents.
- **Increased workload.** Lesson preparation, sharing online links, and organizing group work for students in two different environments essentially doubled teachers' workload.
- **Tech issues.** Technical glitches and/or Internet and bandwidth limits impacted concurrent instruction; in-person students were prevented from logging into BBCU and unable to interact with online classmates. Issues with connectivity, Internet access, and inefficient hot spots continued.
- **Tech environment.** Managing multiple screens, equipment, and the physical environment was required. Teacher movement was restricted to facing a camera, preventing them from moving around their room, while having to sit or stand in one central location was physically demanding. Without a dedicated classroom, some teachers had to disconnect and reconnect all of their equipment when moving from one room to another.
- **Disengagement.** Students who remained virtual essentially "disappeared" or "became invisible," resulting in increased disengagement. Extended wait time required for online students to respond caused in-person students to lose interest, as did repetition of instructions and in-class conversation for virtual students.
- **Attendance.** Fluctuating in-person student attendance required increased time in taking and reporting attendance and disrupted lesson plans.
- **Instructional/social-emotional support.** Reporting requirements for SPED documentation increased. Amplified emotional needs of returning students made it "hard to find time for those conversations or scheduling meetings with a counselor."
- **Classroom management.** Classroom behavior rules and routines had to be reinstated for returning students; appropriate social distancing and mask-wearing protocols were required.

### *Technology Use and Instructional Practice*

Teachers and SBTS were prompted to discuss their use of technology in instructional practice, changes to instruction, and impact on student learning. They were then asked to describe their professional learning opportunities and additional

supports needed. Finally, both groups were asked to identify the benefits and drawbacks of technology use in instruction.

**Successful instructional strategies.** Participants were asked about instructional strategies or approaches used during distance learning that continued once students returned to school buildings. A majority of teachers (60%) reported continued incorporation and use of digital tools into their daily routine, including interactive apps like Pear Deck or Flipgrid, online assessments/automatic grading, review games, science labs, and recorded lessons. As one teacher noted, virtual instruction “forced us into using digital tools that I never would have used any other year.” About a quarter noted continued reliance on the Google and BCCU platforms as organizational tools for student assignments, access to materials, and classroom structure. A few teachers (12%) reported that their teaching delivery had changed to incorporate the use of playlists, self-paced instruction, and the workshop model. As one teacher stated,

*So it's like taking what you know as a good teacher. But like I said, you just fold it into a different kind of batter. The recipe is still the same. Go with what you know to be really good teaching practices that are going to make good outcomes.*

Similarly, a few teachers (12%) reported adding more check-ins and community builder-type activities into their routine, increasing the use of breakout rooms and collaborative online projects, and creating a consistent schedule and procedure to create continuity and structure for students as strategies they have continued to use.

For SBTS, the responses to this question were particularly varied. One or more SBTS commented on the following instructional strategies/approaches from virtual learning that continued during concurrent learning: the Engagement Model ( $n = 1$ ), offering student choice ( $n = 1$ ), student-owned activities/learning ( $n = 2$ ), more independent work than group work ( $n = 1$ ), 1:1 writing conferences ( $n = 1$ ), slower pacing ( $n = 1$ ), rethinking grading and assessment ( $n = 1$ ), videos or asynchronous learning ( $n = 2$ ), recording class ( $n = 1$ ), less live lecture ( $n = 1$ ), pervasive use of technology ( $n = 2$ ), Schoology ( $n = 1$ ), Google Classroom and/or Suite ( $n = 2$ ), Pear Deck ( $n = 3$ ), Wixi ( $n = 1$ ), and Quizlet ( $n = 1$ ). Two SBTS (17%) noted that attention to students' well-being, community, and/or socio-emotional learning continued. Two SBTS (17%) noted that teacher collaboration had continued.

**Changes in instruction.** When asked how the pandemic affected changes in instruction, a third of teachers (33%) reported that due to the pandemic, more tools were available for instruction, presenting an opportunity to use resources they might not have used otherwise. One social studies teacher pointed out that certain content lends itself to using technology and she used technology to present virtual guest speakers noting, “I want to bring the world inside of the classroom.” A few teachers (28%) noted that their instructional style was impacted as a result of virtual learning.



For some, this meant a reduction in hands-on activities, partnering, cooperative learning and collaboration. Others noted an increase in using the workshop model approach, individualized instruction, blended learning, and recorded lessons. Some teachers reduced the amount of direct instruction/lecture they delivered, while others increased their lectures and had students typing notes more frequently. Basically, teachers had to adapt and adjust their teaching style depending on the tools they knew how to use, as well as what the best fit was for their students.

Perhaps stating the obvious, a quarter of teachers noted that due to the pandemic, everything now had to be digitized as technology use became "crucial." This transition "forced reluctant teachers to embrace technology," but as another teacher stated, "daily technology use was forced upon teachers and students." A similar number reported having to pare down their content and deliver curriculum in a shorter timeframe. The compressed school day made it more difficult for teachers to interact and make connections with their students, such as through feedback, as noted by a few (12%) teachers. This was especially true for foreign language instruction, which relies on interactive and interpersonal instruction.

On the other hand, some teachers acknowledged that their instruction "had to be incredibly focused," streamlined, and more structured in order to deliver content. Or, as one teacher explained:

*And I really cut out everything that wasn't just the essential of what we were doing that day. Because it seemed like you really had to just hammer your objective in order to accomplish that. And anything else that you tried to do was sort of a distraction.*

Others added the pandemic necessitated changes in how to check for student learning through the use of online tools, as well as how to administer assessments and exit tickets. Three teachers admitted that their tech skills improved as a result their reliance on tech tools for instruction.

SBTS respondents identified a number of positive changes in instruction that resulted from the pandemic. A few SBTS (30%) noted that their schools focused their attention on the most essential state content standards, and one of these SBTS commented that students did well on the state tests. Other comments about instruction included that there was reflection about how best to assess student learning ( $n = 2$ ), more attention to pedagogy ( $n = 1$ ), different ways of engaging students ( $n = 1$ ), the Engagement Model ( $n = 1$ ), less lecture ( $n = 1$ ), widespread use of Schoology and BBCU ( $n = 1$ ), personalized learning ( $n = 1$ ), more student choice ( $n = 1$ ), and more student-centered learning (1). Two SBTS (17%) mentioned the increased focus on student well-being, community, and/or socio-emotional learning. Some SBTS (25%) commented on teachers' increased skill in and usage of technology tools, and another commented that students and family had built their tech skills.

**Impact on student learning.** Regarding the impact on the use of technology for student learning, a third of teachers reported that the use of technology for student learning was also changed as a result of the pandemic through the use of technology as the primary means of instruction and learning or, as one teacher stated, “It became all tech all the time.” Technology became the central component of learning; it was no longer an add-on or enhancement. Devices replaced cell phones for completing coursework. As a result, a few teachers noted that students had to learn new applications and how to use the technology. Others indicated that students had to learn the basics of computer use, like keyboarding, but became more self-reliant as they learned to problem solve and troubleshoot computing issues. Still others agreed that the influx of technology increased student access to many useful platforms, such as Brain Pop and Newsela. Students became more familiar with online and digital tools for independent learning, as well as gained access to enrichment activities. Importantly, technology was put into students’ hands, giving them access to wider learning opportunities: “It accelerated diffusion of the use of tech for all students.”

A few teachers (15%) noted that students’ ability to engage in different ways was impacted through the use of technology, such as being more creative in completing assignments, as well as improving their collaborative skills. Students had to be self-motivated and exhibit more independence learning in the virtual environment. Finally, a similar number of teachers reported that students were more accountable in the tech space because they had to “own” their learning by logging in, showing up to class, showing mastery, and turning in assignments.

Not surprisingly, a third of SBTS interviewed indicated the increased role for technology in student learning, although one of these referred to the overuse of technology. Another commented, “I feel like it [technology] went from being a like a bonus to being the vehicle of learning.” Another read aloud the mantra on the SBTS sweatshirt they were wearing, “Technology will not save us. Relationships and pedagogy will,” and commented that teachers now realized the truth of this mantra as well. One SBTS reported that teachers had embraced technology and identified Pear Deck, Padlet, and Google Suite as particularly popular applications.

A number of SBTS commented on students’ increased abilities and experiences. One SBTS noted that while students had communicated virtually before for social reasons, they learned for the first time to use virtual communications for academic purposes, and another commented that their technology skills had increased. Some SBTS (25%) commented on students’ increased independence in learning or problem-solving. One SBTS reported that students were collaborating and supporting each other more than before, and another reported that students had become better self-advocates and wanted more of a voice.

Related to students' increased abilities and broadened experiences, SBTS also noted positive changes in what was asked of students. Two SBTS (17%) commented on students using technology to create. As one of them put it, "while we were an FCPS On school [and thus students were accustomed to using technology before the pandemic], I think now they've had more opportunity to use it [technology] to create rather than consume." The other commented that with the information of the world at students' fingertips, the question was how they would produce it in a new form, not how would they regurgitate it. One SBTS noted that teachers were doing a better job at offering students choice.

**Professional learning opportunities.** When asked to describe professional learning opportunities they participated in, roughly half of teachers (43%) described professional development as "self-directed" and encompassing app-specific platforms, such as Pear Deck, BBCU, ST Math, and Schoology. Roughly one-quarter explained that PD was more tech focused, such as how to use the technology and equipment setup, especially as it pertained to concurrent teaching. Teachers (24%) reported working with their SBTS, T-SPEC, and/or tech-team as providing PD and tech support throughout the year. A few teachers (14%) said there were many opportunities for PD (many of them useful), at the beginning of the year. However, a few teachers (17%) reported that they were overwhelmed by the amount of PD available to start the school year, they could not remember, nothing stood out, and that much of it was a blur. Teachers (10%) described content-specific PD which they attended either online or through team meetings. A small number reported they attended equity/cultural responsiveness training.

A subset of teachers ( $n = 16$ ) attended the ISTE Summer Academy, and 59% of these agreed that the training was helpful. (It should be noted that two of the respondents did not complete the training.) Various descriptions as "more 'big picture'" and "extensive tech training," one teacher noted that it also provided guidance on how to build relationships in a digital environment. Another commented that it presented practical information about making videos while someone else said they received good information regarding available tech programs. One teacher appreciated having a month to complete the modules, while others noted having practice time and time to reflect, as well as the teacher discussion board, as beneficial. As one teacher stated, ISTE "helped me think about how I was going to approach the students." On the other hand, 35% of teachers reported that the ISTE PD was not helpful or meaningful to them for the following reasons:

- Already implementing best practices; did not learn anything new
- Too theoretical, wanted more practical experience
- Wanted training in classroom management versus more technology
- Not enough "stop and check-in moments" to the training
- A lot there; overwhelming

A few teachers (21%) indicated that they found their own online resources in support of their instructional practice. These included attending online content specific conferences, strategy workshops (e.g., Learning at the Primary Pond), or online tools resource sites, like Ditch That Textbook or Slides Mania. Others reported receiving more support through sharing resources with colleagues, school specialists, and instructional coaches. A few teachers (17%) found app-specific trainings, such as on Pear Deck, math apps, and Schoology to be most helpful. Ongoing training on new instructional tools to enhance instruction were also cited as beneficial. As with the start of the school year, however, some teachers reported experiencing “information overload” with no time to process what they were learning and no clear understanding of what was the priority. Teachers were “bombarded” with so much training that some reduced the amount of PD they attended because they already had so much more on their plate, or that the time spent in training could have been devoted to lesson preparation. One teacher said now that she had time to review some of the trainings, she did not know where to find them. Less than 10% of teachers reported little to no impact on their instructional practice as a result of the training they received. The reasons cited included that the training seemed like “trial and error,” that the PD support was “overly simple and redundant,” or a more tech-savvy teacher who wanted more IT support. A small number of teachers cited training that was more focused on curriculum building than technology as particularly supportive, while a similar number reported that trainings on cultural awareness/cultural bias, SEL, equity, and social justice had impacted their teaching.

One SBTS described teachers’ reflection on and implementation of the Engagement Model as an impact of the PD. Another said that PD did not have much impact while a third said that it was appreciated. While the question asked about the extent to which professional learning opportunities and supports *impacted* instructional practice, most other respondents simply catalogued the PD offerings – in some cases with a sense of pride and accomplishment – without reflecting on the magnitude or nature of the impact of this PD.

Some SBTS (25%) mentioned the professional learning that happened as a result of organic teacher collaboration or collaboration within formal teams. Another commented on the collaboration among SBTS as they “banded together as a community of technology specialists like we’ve never banded together before.” They used to be “these little lone islands in our own buildings.” Lately they’ve “really counted on each other” and shared materials and ideas and occasionally even “commiserated.”

**Additional needed supports.** Teachers were asked to comment on what additional supports were needed to continue positive instructional practices acquired during virtual and then concurrent learning. Themes centered on professional development, solicitation of teacher input, increased time, the importance of SBTS, and tech support.

- **Professional development.** Overall, a large portion of teachers (90%) provided feedback on the subject of professional development. Teachers want more training in general, including guidance on how and when technology should be used. Teachers also requested PD that is more content and grade level specific, including training on classroom management and ways to encourage student engagement with technology. Responses also reflected the need for clarification on what tools teachers should be using (“filter through the fluff”), and then explicit guidance on those tools and how to use them. Additional suggestions included more SEL training and “support for building a more equitable learning environment.” Finally, some teachers recommended creation of a repository of resources so that teachers can find them for later review.
- **Teacher input and peer collaboration.** About a quarter of respondents would like to see more teacher input into decisions that impact instruction, as well as more collaboration among teachers to tap into their knowledge base and share what they know works best. As one teacher noted, in-service and teacher training has “become a chore...and more teacher choice is needed to make trainings effective.”
- **Time.** Teachers (21%) next reported the need for more time for planning, reflection, mastery of new technologies, and creation of tech-infused lessons as supports to continued positive instructional practices. One teacher noted that training is often a “one and done...That’s not really going to cause a shift in how a teacher uses technology.” Rather, teachers want the opportunity for training and time for reflection, hands-on use, then follow-up and review of implementation, support, and suggestions for improvement. Further, teachers recommend a more gradual introduction to digital tools over time, with more focused, “deep dive” training on specific apps/platforms being used, such as Schoology.
- **Importance of SBTS.** The importance of continued SBTS support was also cited by a few teachers. While praising the school’s SBTS and tech teams, teachers reported that SBTS were “crushed” this year, noting that more tech support in general is needed.
- **Tech support.** Along those lines, a few teachers (12%) noted that students need training in basic computing skills, as well as access to hardware support, both of which impact their ability to deliver instruction. Additionally, similar numbers of teachers pointed out that support for reliable Internet and working equipment were essential in delivering instruction using technology.

In response to other questions, SBTS had variously noted the importance of SBTS, teacher collaboration, school leaders, and district resources and training as significant in the transition to and relative success of virtual and concurrent learning, and again in looking ahead to the future all these groups were mentioned.

A number of SBTS mentioned teachers' central role in professional learning going forward, including teachers learning from each other and teachers selecting their own PD. One SBTS noted the need for teacher reflection. Some SBTS (25%) felt teachers needed to be able to choose and access the PD they discern they need, with one of these hoping for more on-demand asynchronous trainings, interactive rather than formal PD, and shorter PD sessions, and with another envisioning teachers going through their own Plan–Do–Study–Act (PDSA) cycles on topics of their own choosing. A quarter of SBTS wanted to see teachers learning together and/or from each other, including through observing or hearing about what other teachers are doing, leveraging the collaborative team model, and other forms of collaboration or discussion; one of these SBTS commented,

*FCPSOn was successful because it was a focus for everyone, so when we stopped that focused momentum a bit it became more of a struggle. It's hard for me to continue to promote blended learning as good instruction without everyone on that same page. So more focused goals [would be helpful going forward.]*

One SBTS felt that SBTS should play an important role in facilitating discussion of learning loss and remediation. Another hoped that there could be more SBTS to support teachers, students, and parents.

A role for school and district leadership was also noted. One SBTS hoped for continued support from FCPS to introduce new tools and provide professional development for teachers to think through the best way to apply technology. Another hoped that FCPS would provide continued support but did not specify how, and also hoped that school leaders would visit classrooms to see the need for various tools.

Another SBTS mentioned the needs to develop a better approach or tools for summative assessment, to “find the balance with when to use technology” and when not to, and to respond to the challenges in “classroom management” and “try[] to almost detox [...] from the technology” and “get[] students to really engage in being back in the classroom.” Another SBTS noted the need for more wireless access points and better computers.

One SBTS anticipated the transition back to school would be hard and hoped for a gentle reentry, “not adding anything new” and instead “tak[ing] what we learned and

kind of just go[ing] with the flow and figur[ing] that out. Remember what teaching was like when you had a full class with 25 kids in front of you.”

**Benefits.** As might be expected, teachers were highly motivated to share their thoughts on the benefits and drawbacks regarding the use of technology and instruction. We first address the benefits.

- **Fast and efficient access:** Fast and efficient content delivery and access to resources no matter the location. Technology creates efficiency in instruction, such as through the Substitution-Augmentation-Modification-Redefinition (SAMR) model. Increased ability to provide more consistent and frequent feedback. Technology use in instruction is a viable form of school in emergencies or when students are absent.
- **Increased access:** Access for both students and teachers “opens up limitless possibilities” in terms of primary sources, lesson planning, and new information; teachers can “take learning outside the classroom. It just doesn’t exist in those four walls with technology.”
- **Increased engagement:** Technology use can increase engagement for some students, particularly those who are less likely to interact with their classmates.
- **Increased interactivity/collaboration:** Skill practice is more fun with apps like NoRedInk and Kahoot; teachers are able to be more creative with lesson plans. Tech use can facilitate collaboration among students.
- **Self-directed learning:** Students can engage in more self-directed learning and become more independent thinkers. Technology creates opportunities for student flexibility, creativity, and/or independent learning.
- **Differentiation:** The variety of digital tools can beneficially meet many instructional needs; tech use can assist with personalized or individualized learning experiences.
- **Preparing students for the future:** Technology literacy skills are critical in preparing students with 21<sup>st</sup> century skills needed for future careers.

**Drawbacks.** In addition to the above benefits, teachers and SBTS were prompted to describe drawbacks.....

- **Inappropriate use or overdependence:** Students lack discipline in a virtual environment and need supervision and instruction in digital citizenship. There is too much reliance on tech tools such as online translators or Google to provide answers. Inappropriate use occurs when

students watch a YouTube video that is considered technology integration into the classroom, or when used like a band aid: “just put kids on a computer to keep them occupied.” Too much reliance on technology makes it more difficult to gauge student engagement and understanding. Students suffer fatigue from too much screen time and become overwhelmed by too much technology.

- **Distraction, disengagement, gamification of learning:** Technology use can encourage disengagement and distract students from content, especially when it is presented in a game-like setting.
- **Impact on relationships:** Frequent technology usage causes student social skills to suffer, discourages building relationships, and “social-emotional learning is diminished.” Students miss out on important face-to-face discourse with tech overuse. Student isolation or lack of socialization and disengagement are notable drawbacks to tech use.
- **Cheating/academic integrity:** Access to websites like Google and Sparknotes make it easier to cheat and more difficult for teachers to gauge student learning.
- **Restricted hands-on access:** Tech use reduces the amount of hands-on work students should be performing, and almost always eliminates students’ ability to show their work. Reduced hands-on work results in a loss of tactile skills, like handwriting and drawing.
- **Time consuming:** Technology integration is time consuming to plan, get students to the correct link, and challenging even when students are all present in the classroom. Not all students are tech savvy especially when there is an expectation for students “to have a facility with technology that is not necessarily reasonable.” Tech integration is one more thing teachers have to learn. Language barriers can limit access to learning with technology usage.
- **Tech use in general:** Technology glitches present obstacles that are sometimes difficult to overcome and can discourage users who are not as tech savvy as their peers. Providing devices to students, many of whom have their own device, can be viewed as a drain on district resources.

### *Future Use of Technology and Instruction*

Finally, teachers and SBTS were asked to comment on their perceptions of technology integration into instruction, what they see as effective and ineffective use of technology, and the role of technology in the future of learning.

**Perceptions of technology integration.** When asked their views on the use of technology and instruction to support student learning, several teachers (28%) see



technology and instruction as providing students tools for more options of expression and creative learning. Authentic assessment and more project-based learning were mentioned as examples of how the integration of technology into instruction will benefit students. In addition, a few teachers see continuously improving technology as, among other things, a means to support students with special needs, such as speech to text functions, as well as efficiency in data sharing for IEP and 504 meetings. Auto-grading and instant feedback were also mentioned as tech tools that can support student learning. An increase in personalized learning, self-paced learning, and blended learning were offered teachers (17%) as “opportunities for differentiation and choice of learning experiences,” leading to more student independence. Using the flipped classroom approach was also mentioned, exemplified by the Modern Classrooms Project model. A few teachers (10%) see continued use of technology as increasing opportunities for collaboration, while a similar number cited providing more students access to learning resources, as well as learning skills for the future, as supportive of student learning. A few teachers (14%) believe technology will have an increased presence in their instruction, and as they become more comfortable with the use of tech, “teachers will become more flexible in the way they deliver instruction.”

Having said that, teachers (17%) cautioned that there needs to be a balance between using technology and more traditional teaching methods. While integrating technology “is going to be integral to learning,” it should not be the only thing. Teachers noted that during the past year, students lost social skills, the ability to think critically, and “interact with paper, write, learn how to analyze text.” The impact on younger, elementary age students, was even greater. When speaking of technology and instruction, a similar number of teachers agreed that, “It’s a tool, one of lots of tools.” As with their colleagues who recommend more of a balance, technology can enhance instruction when viewed as an instrument “added to teachers’ toolbox,” but should not be used at the expense of hands-on, personal interaction on the instructional landscape.

For SBTS, the responses to this question were varied. And in fact, one middle school SBTS reported that their school had surveyed teachers about this question and uncovered a range of perspectives at their school as well. According to their survey results, some teachers wanted to go paperless to save them time photocopying materials. Some teachers expressed interest in and described usage of digital tools for feedback and data collection. Some teachers “are trying to figure out how to merge” “traditional” and “virtual practices.” Some teachers “don’t want to look at a screen at all.” The other middle school SBTS indicated that their goal for next year was that teachers would ask themselves how they are using technology to engage students and/or enhance the lesson – not just using it “because it’s there.”

Among elementary SBTS, one anticipated that teachers would be more open to technology and confident in using it to promote student learning, and another anticipated that technology would be used for student-centered instruction and student

choice, which will foster student engagement. On the other hand, the other elementary SBTS anticipated that teachers would need coaching and encouragement to be open to technology going forward:

*This year has had a lot of negativity, and technology has held a lot of that. Technology has been the thing I have to learn, the thing that causes me the most pain and stress...and now I do think it's going to take some mental coaching about how to have a positive approach with all of it and still want to do these different things with technology.*

While this SBTS thought teachers might be resistant to technology, the person also commented, "Students are going to expect to have the same access, the same experiences, and the same ability to create and use technology."

Among the five high school SBTS, three (60%) anticipated that technology would continue to be very important to instruction; as one of them commented,

*We have found how we can use some of these tools and resources to really allow students to demonstrate their learning in various ways. It can provide students the opportunity to, again, work through things, possibly at their own pace, or find ways that they can collaborate as well with peers or find support from peers or teachers.*

Another high school SBTS described the value of technology for students with social anxiety and disabilities. The other two high school SBTS anticipated that technology would continue to be used and valued, but less centrally than it had been during the pandemic. One of these SBTS hoped to get back to more balance between technology use and physical or interactive learning experiences, including collaborations, think-pair-share, and stations. Technology could give students a way to demonstrate their learning as opposed to being the sole way of taking in information, and could provide a way for providing students with an archive of asynchronous on-demand content. The other enumerated specific applications that the school would likely continue to use and also saw technology as an important vehicle for providing feedback on student work, but felt students and teachers wanted some "relief" from technology and would want other sorts of learning experiences too.

**Effective instructional practices using technology.** Teachers and SBTS were asked to note the instructional practices using technology that they viewed as most effective. Themes from teachers included:

- Tools to encourage teacher collaboration and sharing of resources/lessons (34%)
- Providing access to a variety of resources and simulations (12%)
- Differentiation and providing students with a variety of response options (19%)
- Blended learning/flipped classrooms (12%)
- Self-paced learning and project-based learning (10%)

- Recording lessons for later review (9%)

Themes from SBTS included:

- Technology that encourages student choice and creativity (50%)
- Differentiation and personalization (25%)
- Student-centered instruction (17%)
- Student collaboration (42%)
- Feedback, assessment, and data analysis (42%)

**Less effective instructional practices using technology.** Teachers and SBTS also noted technology uses that they viewed as less effective and should be discontinued. Teacher themes included:

- Inappropriate use of technology, such as “drill and kill” electronic flashcards, as being ineffective uses of tech (29%)
- Trying to use too many applications or programs, or any lesson where instruction is entirely delivered through technology, were also seen as ineffective by some respondents
- Labs, hands-on activities, and math instruction, as reported by teachers (14%)
- Note taking (10%)
- Assessment (10%)
- Reading and writing (9%)
- Discussion or speaking (especially in language classes) (9%)

Themes from SBTS included:

- Digital worksheets (25%), with an additional SBTS mentioning overuse of Google Forms
- Direct instruction (e.g., emphasis on lectures and PowerPoint) (17%)
- Traditional or summative assessments (17%)

**The role of technology in the future of learning.** Perhaps stating the obvious, a third of teachers agreed that technology will continue to play a larger role in education, becoming “fundamental rather than an ‘add-on’ feature.” As one teacher noted, “A class that doesn’t incorporate technology is doing the kids a huge disservice.” Several other teachers (24%) see the use of technology as providing a variety of resources and tools that will afford students the opportunity for increased student choice while facilitating collaboration and creativity. In addition, several foresee tech as enhancing their instructional practice by enabling differentiated instruction, blended learning, guided practice, and assessment. Almost a quarter noted that technology’s role is to expand student access to learning opportunities and, as demonstrated by this year, allow learning in various formats from different locations. Similarly, respondents shared the importance of technology in preparing students for the workforce, teaching

them 21<sup>st</sup> century skills, and developing digital citizenship and literacy. Teachers' responses were tempered, however, as almost a quarter reiterated a concern for overuse and the need to maintain a healthy balance between reliance on technology and more traditional methods of instruction.

For SBTS, the most common role foreseen for technology, by a third of respondents, was in preparing students for their careers and/or lives outside school. One said, "It can really help our students to grow and to be better prepared for a future where technology will always be a part of their lives." Another commented, "There is no career path without technology." One of these SBTS also emphasized the importance of teaching about digital safety and citizenship. Additional themes by SBTS were the value of technology for making possible connections and possibly collaboration across distance, whether among students, educators, and/or outside experts (17%), the role of technology in differentiation, and its value for personalization and for student self-assessment and accessing of appropriate resources. One SBTS commented that because teachers' direct instruction methods can be replaced by technology, they add value by facilitating student learning versus being only a source of information or a "gatekeeper of the content." This SBTS hoped this would "cause a reevaluation of what the role of the teacher is in the classroom." Another SBTS anticipated that technology would grow, but asserted that technology cannot replace good pedagogical practice and community building. Echoing a theme common across questions, one SBTS highlighted the role of technology for student voice and choice.

Of the respondents who commented on the future *magnitude* of the role of technology specifically, one commented "I think [technology] plays a much more significant role than it did before. I think it's now the vehicle of learning." Another anticipated it would play a "pretty significant" role, but "hopefully not as significant as it was this year." Another said, "I don't see how we can ever go back to not having technology;" this SBTS reported that while some SBTS were concerned that teacher would react against computers and "go back to completely paper and pencil," this person did not anticipate that. Two SBTS (17%) saw a moderate role of technology as a tool that should be used when it best meets the needs.

One SBTS emphasized the value of the SBTS role and said,

*Every school has learned the value of having someone [like an SBTS] who is technology-proficient or at least quick to learn and is also familiar with the classroom. [...] Being at a school, knowing the environment, knowing the students, knowing the culture all that as a huge part in [...] supporting the school with technology integration.*

However, this person expressed concern that because teachers had the direct experience with virtual and concurrent learning and SBTS did not, "they [teachers] are more of an expert on things," which necessitates rethinking the role of the SBTS. "I

think our role needs to shift to very much more of a co-constructing role for using technology.”

## Discussion

The original purpose of the present study was to gather formative and summative data related to the FCPSOn initiative during its fifth year of implementation in the 2020-21 school year within Fairfax County Public Schools (FCPS). However, due to the SARS COVID-19 pandemic, data collection activities initially planned were placed on hold. The present study sought to explore the experiences and reactions of stakeholders to distance learning over the past two years. Participants included Phase One (Chantilly Pyramid and eLearning Backpack) schools, which began FCPSOn implementation in 2017-18; Phase Two (high schools) that began implementation in 2019-20; and Phase Three (middle schools) that began implementation in 2020-21. An additional three randomly selected elementary schools were included since all elementary school students and teachers received laptops due to the pandemic and need for remote learning. A key component of FCPS’ distance learning implementation included professional development (PD) in both virtual and concurrent learning environments.

### *Preparation and Implementation of Virtual and Concurrent Learning*

Several themes emerged from stakeholder interviews regarding experiences and reactions to virtual and concurrent learning models implemented during the 2019-20 and 2020-21 school years. Virtual instruction began in the spring of 2020 and continued through the fall of 2020 with all students and teachers engaged in remote learning. Teachers reported being overwhelmed and confused by the amount of professional development offered prior to the start of the 2020-21 school year. SBTS agreed, noting the need to build teachers’ technology skills quickly to support implementation. Both groups indicated that there was no clear or consistent messaging from the district regarding the preparation for virtual learning, citing shifting plans, expectations, and last-minute decisions by FCPS. Different approaches to preparation by schools, as well as variations in SBTS deployment, created inconsistencies across the district in terms of preparation and implementation. However, some teachers and SBTS acknowledged that the start of the 2020-21 school year was smoother than expected, largely due to having taught virtually in the spring of 2020, and having two extra weeks before classes began to prepare.

As the school year progressed, teachers and students became more comfortable using technology, resulting in more efficient implementation and higher student engagement. Both stakeholder groups agreed that an unexpected outcome of virtual instruction was increased interaction among normally reticent or introverted students.

SBTS noted that teachers “figured out” how to build community in a virtual learning environment.

Concurrent learning began in February of 2021 and by April 2021 most students were expected to return to in-person learning four days per week. Teachers reported having less time to prepare for the concurrent teaching model implementation compared with the virtual learning model and overwhelmed by the professional development provided by the district. Teachers had to learn how to navigate in a concurrent teaching classroom setting, familiarize themselves with new equipment, and create lesson plans for students in two different learning environments. SBTS’ attention shifted to selecting and setting up equipment and providing subsequent training, which they themselves deemed as “not always sufficient.” Teachers struggled with simultaneously addressing the needs of virtual and in-person students. Attendance was also an issue as students expected to be in-person were not consistently present. However, teachers reported the ability to create interpersonal bonds with their students and students with their peers as a notable benefit to the concurrent model. It also became easier to support students who may have been struggling in the virtual learning environment.

In addition to previously mentioned challenges to virtual and concurrent learning, teachers and SBTS expressed concern that issues with access and equity were exacerbated by the pandemic. Insufficient Internet access continued to plague certain student populations, often dependent on the number of home users or where a student lived. In addition, students living in home environments that were not supportive of their learning were at a notable disadvantage compared to peers who had more stable living conditions.

### *Tech Use and Instructional Practice*

Teachers and SBTS alike reported that teacher awareness of digital tools increased as they used tech-based resources they might not have otherwise accessed. The pervasive use of technology for instruction during both remote learning models forced teachers to become more accepting of tech use and learn how to adapt their teaching styles to incorporate digital tools. Both groups acknowledged positive changes to instruction as becoming more student centered, where students were no longer simply consumers of technology. Teachers explored different approaches to teaching, such as “flipping” their classrooms. Both stakeholder groups noted that through the increased use of technology teachers were able to deliver more differentiated lessons to their students, as well as provide instantaneous feedback. However, teachers expressed concern about the negative impact on assessment, noting the inadequacies of summative online assessment tools, having to rely on short, multiple-choice questions, and the issue of academic integrity.

Both stakeholder groups agree that peer-to-peer sharing and support is a much desired and effective method of delivering professional development to inform instructional practice. “Time” was perhaps the most frequently mentioned need for professional learning: time to absorb, reflect, practice, and receive feedback. Teachers want more focused professional development and not be required to sift through a multitude of offerings. They seek grade and content level-specific training, and want more input into PD offerings. More SBTS and tech support is needed. Teachers and SBTS agree that FCPS support is needed to maintain and upgrade existing hardware, including providing reliable Internet access.

### *Future Use of Technology and Instruction*

Participants agreed regarding the necessity of technology in education and can provide limitless possibilities related to preparation for 21<sup>st</sup> century jobs, opportunities for creativity, flexibility, and independence, as well as personalized learning. The use of technology provides teachers with the tools to differentiate instruction for special populations of students. Teachers are no longer limited to what is contained within the four walls of their classrooms and, instead, see technology as providing a window on the world and opportunity for exposure to different cultures, content experts, and virtual experiences. As a teaching and learning tool, technology encourages collaboration and interactivity among teachers and students alike. Technology use in instruction can provide students with more options for expression and creativity. However, both groups of stakeholders stressed that technology is not effective when used as a replacement for activities done by hand, such as worksheets, or as a time filler during the day-to-day routine. Teachers and SBTS voiced concern regarding inappropriate use of technology, such as the gamification of learning. Both groups caution that there needs to be a balance between technology use and more traditional methods of delivering instruction and measuring student knowledge.

### *Conclusion*

Interview respondents did not always present a positive picture of the 2020-21 school year and their experience with remote instruction, but teachers and SBTS alike acknowledged that the school year was “unchartered territory” for everyone involved, and that FCPS did as well as it could given the resources and time available. There were notable yet understandable issues regarding teacher preparation and inconsistent messaging from FCPS. Teachers and SBTS were overwhelmed by the requirements for both virtual and concurrent instruction. Teachers needed more time to absorb, reflect, and practice teaching in very different learning environments. However, in the face of a global pandemic, teachers and SBTS were able to endure and deliver instruction in the face of daunting odds. Teachers became more proficient in their technology use and integration of digital tools into their instruction. Students exhibited growth on many levels, not just academically, becoming more adept at using digital tools and,

importantly, taking ownership of their learning. Both participant groups support the continued use of technology, but caution that it is important to maintain a balance between teaching with technology and personal interaction between teachers and students and students and their peers. Technology is viewed as an important asset but should not serve as a replacement for proven pedagogy. However, for all the difficulties expressed, the experience of and lessons learned from remote instruction has better prepared FCPS teachers, SBTS, and students going forward.

Moving forward, we offer the following recommendations based on study findings for improving technology integration:

- **Professional development:** Provide more professional development on technology use in general, though allow teacher input into most valued or necessary topics. Consider offering grade- or content-level specific PD, encourage peer-to-peer collaboration, time for teachers to practice new digital tools over time.
- **Ongoing support:** Create a repository of training materials and continue to support the SBTS role as a resource for technology integration. Provide increased tech support in schools, support for maintenance and upgrades to existing hardware, and improve Internet access in schools.
- **Tech skill development:** Invest in teacher proficiency in Schoology; increase students' digital literacy through mandatory computer skills courses that address typing and basic troubleshooting skills, as well as digital citizenship and academic integrity.



## Appendix A: FCPS SBTS Interview Guide

### Introduction

1. Before we get into the focus of this interview, would you please share your background, specifically your experience as an SBTS thus far? How would you describe your school's experience in using technology in instruction?
2. We understand that teaching and learning employed various models including virtual and concurrent during the 2020-21 school year. Please describe the model(s) you've experienced in your school during the present school year.

### Virtual learning

We'd like to focus on your experience as an SBTS in the *virtual* learning environment.

1. How would you describe the *startup* and implementation of virtual learning as you experienced it during the 2020-21 school year? What was required of you and your teachers to teach in this model?
2. How did implementation change over time?
3. What went well in using a virtual learning format?
4. What was challenging in using a virtual learning format?

### Concurrent learning

We'd now like to focus on your experience in the concurrent learning environment. We understand this model to involve 1/2 of the students coming to class and 1/2 of the students learning from home and they alternate.

1. How would you describe the *startup* and implementation of concurrent learning as you experienced it during the 2020-21 school year? What was required of you and your teachers to teach in this model?
2. How did implementation change over time?
3. What went well in using a concurrent learning format?
4. What was challenging in using a concurrent learning format?
5. As students have returned to buildings, what strategies/approaches used during virtual/concurrent learning have remained?

### Technology Use (General)

6. How did the pandemic affect changes in instruction?

7. How did the pandemic affect change in the use of technology for student learning?
8. To what extent have professional learning opportunities and supports impacted your teachers' instructional practice?
9. How do you see classroom technology use and instruction evolving in the future to support student learning?
10. What are the benefits/drawbacks of technology use during the instructional process?
11. What instructional practices using technology should continue or grow?
12. What instructional practices using technology are less effective?
13. What additional supports are needed to continue positive instructional practices?
14. What role does technology play in the future of learning?

## Appendix B: FCPS Teacher Interview Guide

### Introduction

1. Before we get into the focus of this interview, would you please share your background, specifically your teaching experience thus far? How would you describe your experience in using technology in your instruction?
2. We understand that teaching and learning employed various models including virtual and concurrent during the 2020-21 school year. Please describe the model(s) you've experienced in your school during the present school year.

### Virtual learning

We'd like to focus on your experience teaching in the virtual learning environment.

1. How would you describe the *startup* and implementation of virtual learning as you experienced it during the 2020-21 school year? What was required of you to teach in this model?
2. How did implementation change over time?
3. What went well in using a virtual learning format?
4. What was challenging in using a virtual learning format?

### Concurrent learning

We'd now like to focus on your experience teaching in the concurrent learning environment. We understand this model to involve ½ of the students coming to class and ½ of the students learning from home and they alternate.

1. How would you describe the *startup* and implementation of concurrent learning as you experienced it during the 2020-21 school year? What was required of you to teach in this model?
2. How did implementation change over time?
3. What went well in using a concurrent learning format?
4. What was challenging in using a concurrent learning format?
5. As students have returned to buildings, what strategies/approaches used during virtual/concurrent learning have remained?

### Technology Use (General)

1. How did the pandemic affect changes in instruction?
2. How did the pandemic affect change in the use of technology for student learning?

3. Describe any professional learning opportunities you participated in this year. To what extent have professional learning opportunities and supports impacted instructional practice?
4. How do you see classroom technology use and instruction evolving in the future to support student learning?
5. What are the benefits/drawbacks of technology use as part of instructional practice?
6. What instructional practices using technology should continue or grow?
7. What instructional practices using technology are less effective?
8. What additional supports are needed to continue positive instructional practices?
9. What role does technology play in the future of learning?