



Statistics Related to the Second Semester 2020-2021 Student Schedules

Technical Report

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Overview

The Knox County Schools (KCS) department of Curriculum and Instruction continues to be interested in studying various aspects of virtual learning during the 2020-2021 school year (SY2021). This document was compiled by the department of Research, Evaluation, and Assessment (REA) to serve as a companion report to the “Statistics Related to the First semester 2020-2021 Student Schedules” (Sattler 2020). This study is intended to document changes in student enrollment data, inform future analysis, and serve as reference material for summary reports of the virtual learning initiative.

Students could be enrolled in four different learning environments during SY2021. KCS Families were given the option of changing their students’ learning environment during the first semester (S1) between October 26, 2020, and November 6, 2020.

- In-person: All instruction is delivered in the traditional classroom setting. A student was considered an in-person learner if all of their second semester (S2) courses were delivered in the in-person setting.
- Base-school virtual: Instruction is delivered in a virtual setting by a teacher based in a student’s zoned school. A student was considered a base-school virtual learner if at least one of their S2 courses was delivered in the base-school virtual setting.
- Quality Education for Students Using Technology (QuEST) virtual: Instruction is delivered in a virtual setting by a teacher hired specifically to teach within the district’s QuEST program or another KCS teacher during the teacher’s plan period. A QuEST course may include students from multiple KCS schools. A student was considered a QuEST virtual learner if at least one of their S2 courses was delivered in the QuEST virtual setting.
- Florida Virtual School (FLVS): Instruction is delivered in a virtual setting by a teacher employed by the Florida Virtual School (a third-party contractor). A student was considered an FLVS virtual learner if at least one of their S2 courses was delivered in the FLVS virtual setting.

Virtual elementary core content (Reading/Language Arts, Math, Science, and Social Studies) is largely taught synchronously. Virtual Elementary related arts content is largely taught asynchronously. Virtual elementary students are placed entirely within a single environment (either base-school or QuEST). Virtual secondary content is mostly delivered asynchronously and secondary virtual students could be enrolled in a mixture of base-school, QuEST, and FLVS virtual courses.

Methodology

Student-level demographic data, discipline data, attendance records, grades, and schedules were extracted from the KCS student information system (ASPEN) between January 26, 2021, and February 11, 2021. Schedule analysis includes courses scheduled during the second semester (Quarter 3 and 4, Semester 2, and Full-Year). Grade, attendance, and discipline data are related to S1 (Quarter 1 and 2, Semester 1, and Full-Year).

An “S1 Virtual Learner Y/N” value was added to the student table in the ASPEN database at the start of SY2021 to identify which students opted into virtual learning during S1. The virtual learner value was initially populated as “NULL” for every KCS student. School-based staff adjusted the virtual learner value to “Y” when a student opted into online learning during S1. Staffers could also adjust the value to “N” if the student opted for in-person learning. Approximately 10% of the virtual learner values were never adjusted from the “NULL” state at the time of the first semester study. All students with the “NULL” S1 virtual learner value were considered in-person learners.

An “S2 Virtual Learner Y/N” value was created before the start of the October 26, 2020, virtual learning selection window. This S2 virtual learner value was initially populated with the “S1 Virtual Learner Y/N” value and the S1 value was locked from school-level changes. SY2021 district procedure allowed school-based staff to allow changes in online-versus-in-person learning modes. Readers should note that when this report references virtual/in-person learning during S1 we are referring to students who had an “S1 Virtual Learner Y/N” value set to “Y” when the S1 student rosters were extracted from ASPEN (October 5, 2020).

The S1 companion study included tables related to student enrollment in secondary courses (by instructional environment). Preparation of the data for this report suggested that the true instructional mode may not be captured by S2 schedule data among secondary students. Virtual students were scheduled into S1 courses to associate a student to the correct teacher with little-to-no regard for the scheduled class period. Scheduled periods are largely irrelevant to secondary virtual learners since the bulk of virtual courses were conducted asynchronously. Although this method facilitates the scheduling process at the school level, REA was able to identify instances where S2 in-person students were scheduled in virtual courses. For example, a student at West High school was enrolled in a yearlong U.S. History course as an S1 virtual learner. The “Virtual Learner Y/N” value indicated that the student transitioned to in-person learning during S2. However, the student’s S2 schedule indicated that they were still enrolled in a virtual U.S. History course. School-based staff informed REA that the student was able to attend an in-person (S2) course with the same teacher and scheduled meeting time as that on the S1 schedule. The U.S. History course was not rescheduled when the student returned to in-person instruction since there was no reason to do so.

Ten percent of all secondary students (n=2,976) are scheduled in a mixture of in-person and virtual courses during the S2 of SY2021. The schedule data does not indicate if a student is an in-person learner scheduled in a virtual course (as in the above example), participating in a hybrid/synchronous course, or has an incorrect “Virtual Learner Y/N” value. The Knox County Schools’ Information Technology department considers the “Virtual Learner Y/N” value to most accurately reflect a student’s learning environment. Consequently, REA uses the “Virtual Learner Y/N” value and not the course schedule information in this S2 analysis.

In this analysis, secondary students were considered S2 virtual learners if the “S2 Virtual Learner Y/N” value was set to “Y” and were scheduled in at least one base-school, QuEST, or FLVS virtual course. Students were considered in-person learners if the “S2 Virtual Learner Y/N” was “NULL” or “N”. Students were also considered in-person learners if the “S2 Virtual Learner Y/N” was “Y” but the students were not scheduled in at least one base-school, QuEST, or FLVS virtual course.

A concatenation of teacher name and local course code was used to identify students (both in-person and virtual) who were enrolled in the same courses. Class sizes were estimated from the number of students enrolled in an elementary-level homeroom course (courses with an ASPEN “Course Description” value of Kindergarten, First Grade, Second Grade, Third Grade, Fourth Grade, or Fifth Grade).

S1 grades were converted to a pseudo Grade Point Average (GPA) to facilitate comparisons between groups. The pseudo GPA was the geometric mean of all S1 grades per the following scheme.

- 93% to 100%, As, and Es were worth 4 GPA points.
- 85% to 92% and Bs were worth 3 GPA points.
- 75% to 84%, Cs and Ss were worth 2 GPA points.
- 70% to 74%, Ds, and Ns were worth 1 GPA point.
- 0% to 69%, Fs, and Us were worth 0 GPA points.
- Courses graded with P (Pass), NP (No Pass), and PR (Progress) were not included in the GPA.

Pseudo GPAs were not weighted for participation in advanced academic courses (Honors, Advance Placement, International Baccalaureate, etc.).

Attendance data was extracted from ASPEN for student attendance between August 24, 2020, and December 18, 2020. The S1 of SY2021 included 75 full instructional days for students.

Results: Student Enrollment

District-level S1 and S2 semester KCS enrollment data (by learning mode) is shown in Table 1. The percent change is calculated as $(S2-S1)/S1$.

Table 1: Changes in Learning Modes: S1 to S2

Learning Mode	Semester 1	Semester 2	Percent Change
Any Mode	59,430	59,252	-0%
In-Person	40,347	46,574	+15%
Base-School Virtual	18,070	11,511	-36%
QuEST Virtual	4,564	4,347	-5%
Florida Virtual	125	32	-74%
Any Virtual	19,083	12,677	-34%

Table 1 indicates the total number of students enrolled in KCS decreased slightly during S2, as did the number of students scheduled in at least one QuEST course. The largest changes corresponded to students leaving the base-school and FLVS virtual environments in favor of in-person learning. It should be noted that the FLVS designs its curriculum for year-long courses. Most participants in the FLVS/KCS partnership were scheduled into semester-long KCS courses. The 32 second semester FLVS students in Table 1 were scheduled in a year-long (rather than semester-long) course at L & N STEM. KCS continues to contract with FLVS during S2 to allow S1 students to complete any outstanding course requirements. A similar program was offered by KCS to high school seniors. The KCS “Blast” program allowed students to complete coursework in January 2021 to earn S1 course credits (for in-person, base-school virtual, and QuEST courses). All “Blast” programming was conducted in an in-person setting.

Table 2 provides additional detail about student movement among learning modes. Approximately 60% of the S1 virtual learners opted for online learning during S2. The virtual learner attrition rates appear to be similar regardless of the students’ participation in QuEST, FLVS, or base-school virtual options. Approximately 10% of students who were new to the district opted for virtual learning during S2. Roughly 3% of students who were in-person learners during S1 opted for virtual instruction during S2.

Table 2: Learning Environment Cross Tabulation; S1 to S2

S1 Learning Mode	S2 Learning Mode		
	In-Person	Online	No Longer Enrolled
In Person	37730	1310	1307
Online	7268	11186	629
Base Virtual	6764	10727	579
Quest	1834	2554	176
FLVS	55	67	3
Not Enrolled	1576	181	0

The percent of students opting to remain in an online instructional mode is contained in Figure 1. Younger students and members of the senior cohort were the least likely to opt back into a virtual learning environment in S2. Overall virtual learner retention was lowest in the elementary grade bands among students who attended the QuEST program during S1.

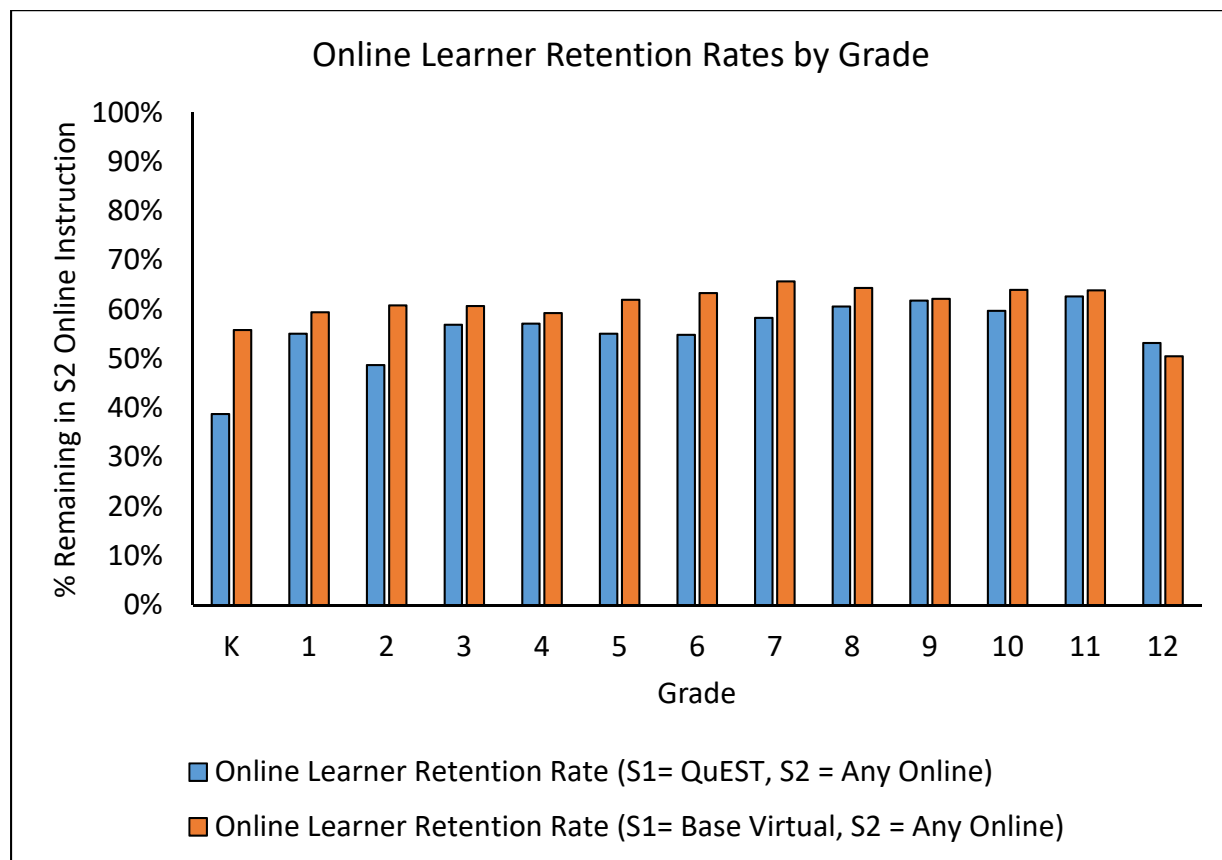


Figure 1: Online Learner Retention Rates by Grade

The schools that had the largest and smallest changes in the percentage of students choosing virtual learning are contained in Table 3. Appendix 1 contains the data for all KCS schools.

Table 3: Changes in Virtual Learners by School

School	S1 Virtual		S2 Virtual		Difference S2% - S1%
	n	%	n	%	
West View Elementary	80	39%	29	14%	-25%
Chilhowee Intermediate	70	40%	29	17%	-23%
Knox Adaptive Education Center	25	38%	10	16%	-22%
Dogwood Elementary	209	42%	98	20%	-22%
Sterchi Elementary	105	30%	30	9%	-21%
Career Magnet Academy	146	56%	86	36%	-21%
Shannondale Elementary	120	32%	45	12%	-20%
L & N Stem Academy	282	48%	164	28%	-20%
Richard Yoakley Alt	10	21%	1	2%	-20%
Belle Morris Elementary	153	36%	76	18%	-18%
South Doyle Middle School	306	37%	251	31%	-6%
Carter High School	224	27%	170	21%	-6%
Powell High School	400	30%	319	24%	-6%
Central High School	441	34%	361	29%	-6%
West High School	454	30%	374	25%	-5%
Gibbs High School	222	21%	154	15%	-5%
Ridgedale Alternative	2	5%	1	2%	-3%
Fair Garden Fam/Comm Ctr	0		0		-
Ft Sanders Ed Dev Ctr	0		0		-
Paul L. Kelley Volunteer	0		0		-

Within the instructional modes, the QuEST program experienced significant turn-over between semesters. Figure 2 shows the percent of the students enrolled in the QuEST program during S2 who were enrolled in the QuEST program during S1. Figures related to base-school virtual enrollment and in-person instruction are included in Figure 2 for comparison.

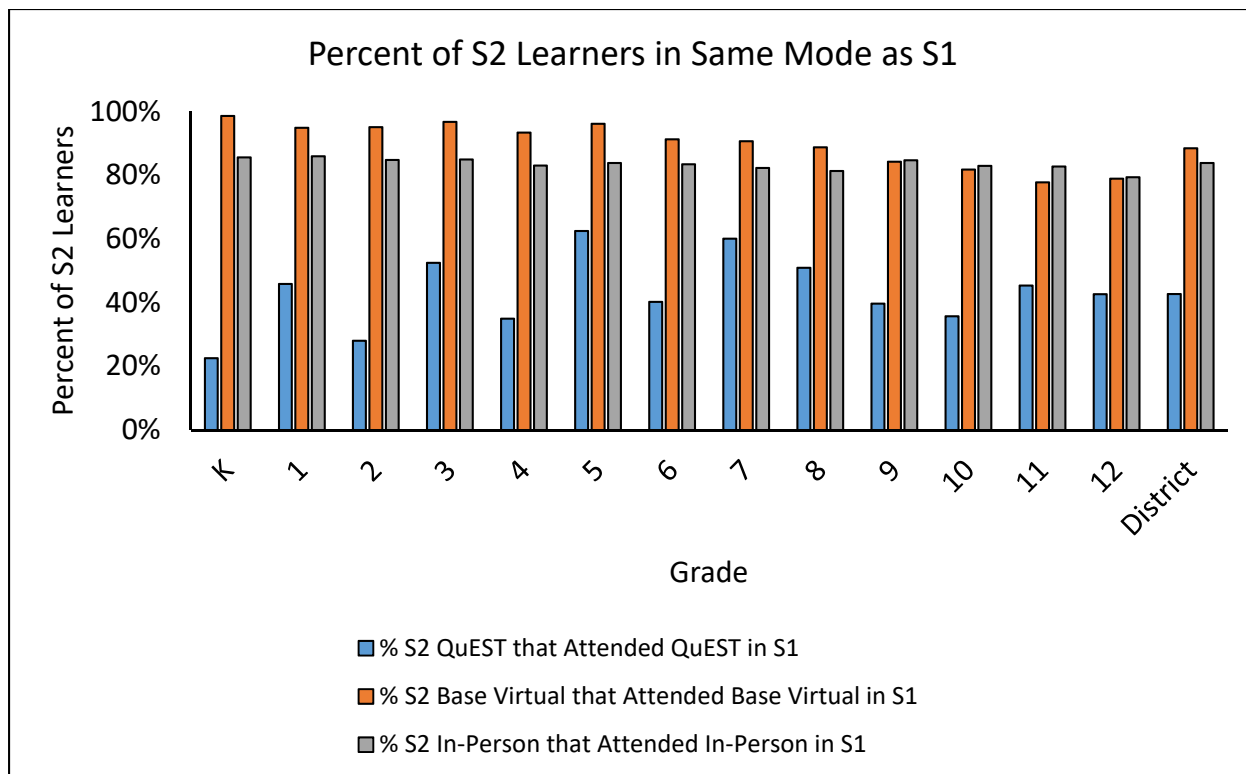


Figure 2: Percent of S2 Learners in Same Mode as S1

Anecdotally, the differences in the learning mode retention rates can be partly attributed to staffing considerations as students transitioned from virtual to in-person instruction. Schools generally converted a base-school virtual teacher to an in-person teacher to accommodate the influx of students returning from virtual learning at the end of S1. The students who wished to remain virtual who were taught by a converted virtual-to-in-person teacher were generally reassigned to QuEST.

Secondary (middle and high) virtual students were enrolled in QuEST and base-school virtual classes on a course-by-course basis. Most secondary virtual students continued to be simultaneously enrolled in QuEST and base-school virtual courses during S2. The elementary QuEST program continued to be self-contained. Elementary virtual learners enrolled in the QuEST program received all of their core content instruction from QuEST teachers. Elementary virtual learners enrolled in the base-school virtual program received all of their core content instruction from a virtual teacher housed in the students' zoned school. The percentage of S2 students who opted for virtual learning and were placed in the QuEST program (by zoned school) is contained in Appendix 2. Table 4 contains the data for the ten elementary schools with the highest and lowest percentages of S2 virtual learners placed in the QuEST program.

Table 4: Highest and Lowest % of QuEST Enrollees by Elementary School

School	n S2 Virtual Learners	n S2 QuEST	% S2 QuEST	% S1 QuEST	Change % Quest (S2-S1)
Corryton Elementary	26	26	100%	100%	0%
Lonsdale Elementary	31	31	100%	23%	77%
New Hopewell Elementary	23	23	100%	100%	0%
Pleasant Ridge Elementary	33	33	100%	42%	58%
Sterchi Elementary	30	30	100%	2%	98%
Sunnyview Primary	33	33	100%	15%	85%
Mount Olive Elementary	24	21	88%	69%	18%
Shannondale Elementary	45	38	84%	6%	79%
West View Elementary	29	23	79%	20%	59%
Bonny Kate Elementary	37	29	78%	52%	27%
Hardin Valley Elementary	199	7	4%	5%	-2%
Bearden Elementary	63	2	3%	3%	0%
West Hills Elementary	145	4	3%	6%	-4%
Rocky Hill Elementary	114	3	3%	5%	-2%
Farragut Intermediate	287	2	1%	1%	-1%
Farragut Primary	206	1	0%	1%	-1%
Dogwood Elementary	98	0	0%	0%	0%
Emerald Academy	103	0	0%	0%	0%
Northshore Elementary	189	0	0%	0%	0%
Sam E. Hill Primary School	15	0	0%	0%	0%

There were two elementary schools (Corryton and New Hopewell) at which 100% of the S1 virtual learners were enrolled in QuEST. Table 6 shows there are six elementary schools at which 100% of their virtual learners were enrolled in QuEST during S2. This increase is likely attributed to the staffing changes associated with students returning to in-person instruction.

Table 5 shows the estimated percentage of S2 courses scheduled by grade-level and learning environment. As an example, 78% of all S2 sixth-grade courses were scheduled as in-person classes, 21% were scheduled as base-school virtual classes, and 1% were scheduled as QuEST virtual classes.

Table 5: Percent of Secondary Courses by Mode

Grade	In Person		Base Virtual		QuEST		FLVS	
	n	%	n	%	n	%	n	%
6	24855	78%	6633	21%	460	1%		
7	23899	75%	7553	24%	502	2%		
8	25248	75%	7638	23%	843	2%		
9	20716	81%	4020	16%	959	4%	1	<1%
10	19388	78%	4299	17%	1099	4%	10	<1%
11	18626	79%	3566	15%	1463	6%	16	<1%
12	18376	85%	2201	10%	954	4%	5	<1%
6-12	151108	78%	35910	19%	6280	3%	32	<1%

The S2 changes in secondary instructional modes mirror the elementary data. The number of scheduled secondary QuEST courses was similar in S1 (n=6,225) and S2 (n=6,280). Increases in the scheduled in-person courses are reflected in decreases in base-school virtual courses.

Even though the total number of QuEST courses is similar in S1 and S2, Table 6 shows the shifts in how middle schools were allocating students to QuEST. Gibbs Middle and Northwest Middle each scheduled at least 150 more courses in QuEST in S2. Farragut Middle and Cedar Bluff Middle each scheduled at least 150 fewer courses.

Table 6: Change in QuEST Courses by Middle School

School	n QuEST Course S2	n QuEST Courses S1	Change in n QuEST Courses (S2-S1)
Gibbs Middle School	316	110	206
Northwest Middle School	167	1	166
Hardin Valley Middle School	321	205	116
South Doyle Middle School	208	120	88
Vine Middle Magnet	78	36	42
Holston Middle School	45	16	29
Powell Middle School	17	0	17
West Valley Middle School	65	65	0
Halls Middle School	29	49	-20
Karns Middle School	72	104	-32
Whittle Springs Middle	23	78	-55
Gresham Middle School	75	153	-78
Bearden Middle School	101	211	-110
Carter Middle School	154	288	-134
Cedar Bluff Middle School	88	241	-153
Farragut Middle School	46	218	-172

Table 7 shows the shifts in how high schools were allocating students to QuEST. The two schools that implement yearlong block schedules (L & N STEM and West High) were the least likely to have a student scheduled in a QuEST course during S2.

Table 7: Change in QuEST Courses by High School

School	n QuEST Course S2	n QuEST Courses S1	Change in n QuEST Courses (S2-S1)
Central High School	387	73	314
Bearden High School	786	515	271
Powell High School	271	29	242
Hardin Valley Academy	564	438	126
South Doyle High School	276	184	92
Carter High School	162	102	60
Fulton High School	175	150	25
Career Magnet Acad.	85	71	14
Knox Adaptive Ed. Center	2	0	2
Richard Yoakley Alt	1	0	1
Paul L. Kelley Acad.	0	0	0
Gibbs High School	376	378	-2
Austin East High School	45	73	-28
Farragut High School	548	584	-36
Karns High School	268	382	-114
Halls High School	426	582	-156
L & N Stem Academy	45	272	-227
West High School	58	452	-394

Table 8 shows the percentages of secondary core courses (English/Language Arts, Math, Science, and Social Studies) by academic level and instructional mode. As an example, in S2 21% of scheduled middle school courses were honors at QuEST. This is compared to 27% of S1 courses that were honors at QuEST.

Table 8: Academic Levels of Core Content Secondary Courses

Grade Level	Academic Level	S2			S1		
		In-Person	Base Virtual	QuEST	In-Person	Base Virtual	QuEST
Middle School	Honors	27%	24%	21%	27%	23%	27%
	Standard	70%	74%	63%	69%	74%	57%
	Intervention	4%	2%	16%	4%	3%	15%
High School	AP/IB/DE/Honors	30%	16%	25%	29%	15%	27%
	Standard	69%	83%	74%	70%	84%	72%
	Intervention	1%	1%	1%	1%	1%	1%

Figure 3 shows the (estimated) mean S2 elementary class sizes by instructional modes. Class size estimates are derived from “homeroom” courses in ASPEN. Class sizes for secondary courses could not be approximated because of the way classes were scheduled for virtual students. As in S1, S2 class sizes in the elementary QuEST program were nearing the maximum allowed by the state Basic Education Program (BEP) formula. S2 QuEST classes tended to be larger than in-person and base-school virtual classes.

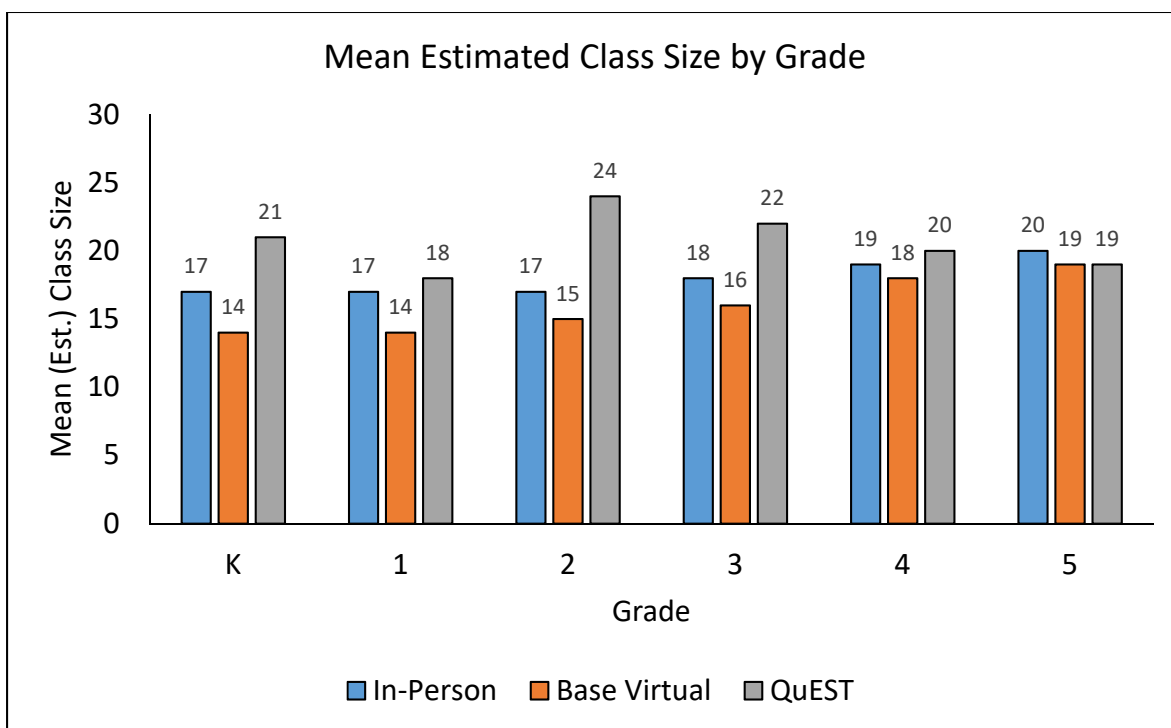


Figure 3: Estimated Mean Class Sizes by Environment

Results: Student Demographics

Table 9 contains race/ethnicity data related to S1 online learners by their chosen S2 learning mode. Students who identify as Asian were most likely to continue with virtual learning after opting into virtual learning during S1. The proportion of students who remained online and identified as Asian (7%) was also larger than the proportion of all KCS students who identify as Asian (3%). The proportion of students who opted for in-person instruction and identified as Black/African American (24%) was notably larger than the proportion of all KCS students who identify as Black/African American (17%).

Table 9: Race/Ethnicities by Instructional Mode

Race/Ethnicity	District Demographics	S1 Online to S2 In-Person		S1 Online to S2 Online		% of Students Remaining Virtual
	%	n	%	n	%	%
American Indian	<1%	27	<1%	65	1%	71%
Asian	3%	201	3%	813	7%	80%
Black	17%	1731	24%	2513	22%	59%
Hispanic	11%	897	12%	1069	10%	54%
Pacific Islander	<1%	29	<1%	27	<1%	48%
White	68%	4383	60%	6699	60%	60%

Table 10 contains information related to the students who opted to change learning modes from in-person instruction to online instruction in S2. Students identifying as Black/African American constituted 23% of the population of S1 in-person students who opted for online instruction in S2 (compared to 17% of the district that identifies as Black/African American).

Table 10: Race/Ethnicities of Students Opting for New Learning Modes

Race/Ethnicity	District Demographics	S1 In-Person to S2 In-Person		S1 In-Person to S2 Online		% of In-Person Students Opting for Virtual
	%	n	%	n	%	%
American Indian	<1%	114	<1%	8	1%	7%
Asian	3%	718	2%	23	2%	3%
Black	17%	5297	14%	306	23%	5%
Hispanic	11%	4420	12%	129	10%	3%
Pacific Islander	<1%	85	0%	11	1%	11%
White	68%	27096	72%	833	64%	3%

Tables 11 and 12 show that online learners continue to be more likely members of the economically disadvantaged (ED) subgroup and less likely to be members of the English Language Learner (ELL) subgroup. Members of the special education (SPED) subgroup were the most likely to remain virtual learners from S1 to S2. ED students were most likely to move from in-person to online but not at a rate that substantially increased the percentage of ED students participating in online instruction.

Table 11: Movement Among S1 Virtual Learners by Accountability Subgroup

Subgroup	% of Online Students in Subgroup		S1 Online to S2 In-Person	S1 Online to S2 Online	% of S1 Virtual Remaining Virtual
	S1 %	S2 %	n	n	%
ED	29%	30%	2431	3300	58%
ELL	4%	3%	319	323	50%
SPED	13%	13%	959	1419	60%

Table 12: Movement Among S1 In-Person Learners by Accountability Subgroup

Subgroup	% of In-Person Students in Subgroup		S1 In-Person to S2 In-Person	S1 In-Person to S2 Online	% of S1 In-Person Opting for Virtual
	S1 %	S2 %	n	n	%
ED	21%	24%	8313	507	6%
ELL	6%	6%	4929	202	4%
SPED	13%	13%	4929	202	4%

The percent of middle school SPED students enrolled in QuEST continues to outpace the percent of SPED students enrolled in base virtual programs (Figure 1). Anecdotal evidence suggests that the disproportionality in SPED enrollment at the middle schools is related to co-taught classrooms and least restrictive environment considerations at students' zoned schools.

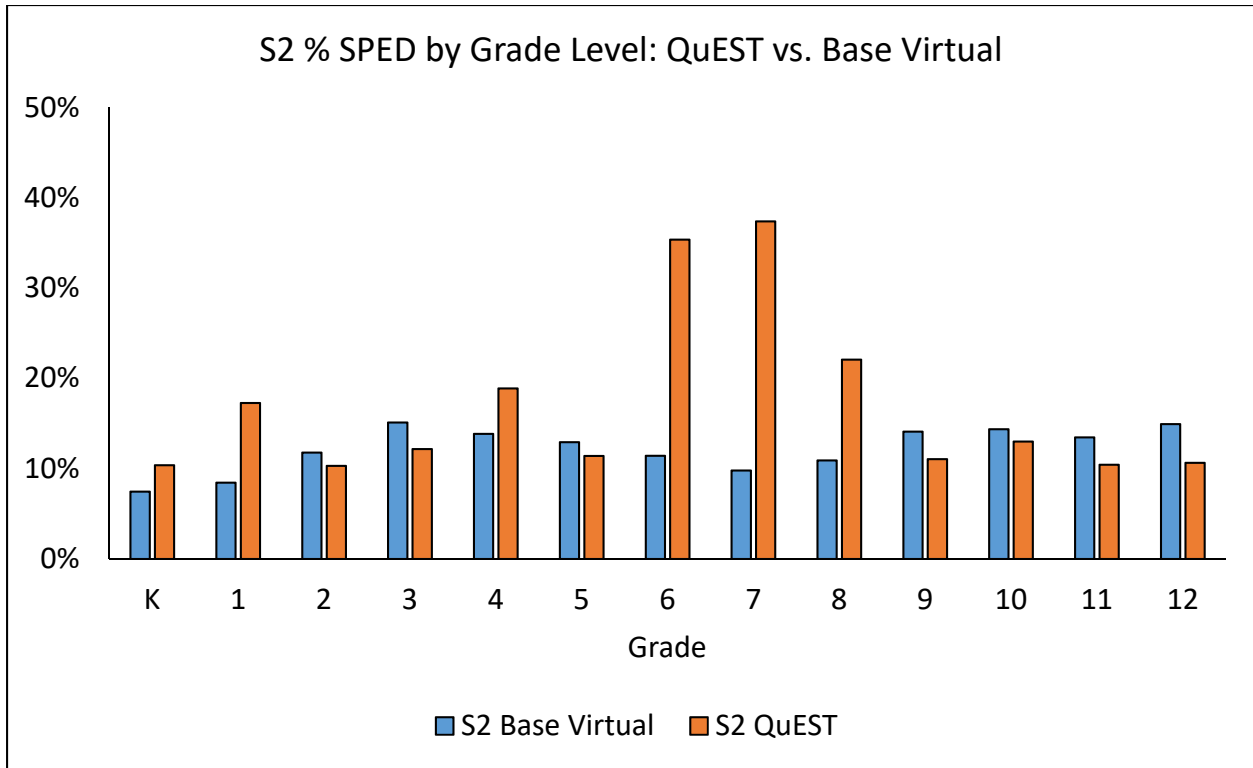


Figure 4: Percent of SPED Students in QuEST and Base Virtual Environments

Results: Pseudo GPAs

Figure 5 shows the distribution of pseudo GPAs for S1 online students by their S2 instructional mode. Students who opted to move from S1 online learning to S2 in-person learning were more likely to be students with lower pseudo GPAs.

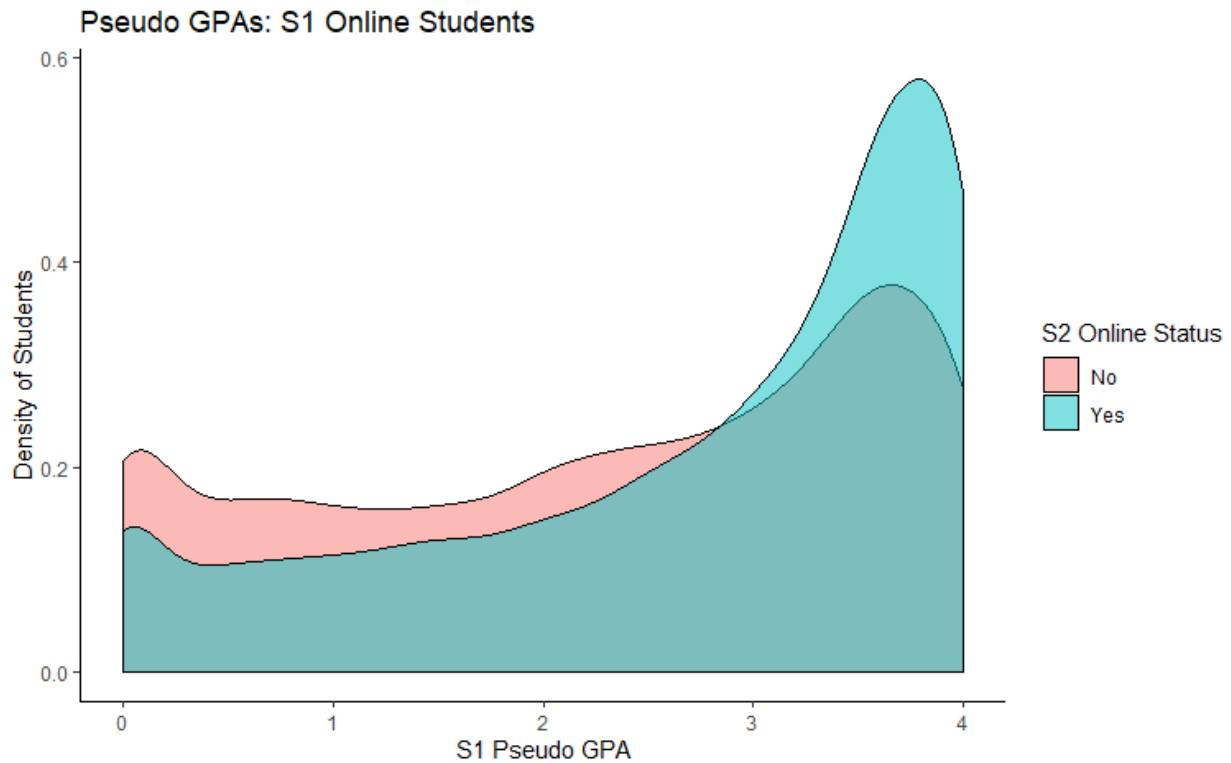


Figure 5: S1 Pseudo GPA for S1 Online Learners

Figure 6 shows the distribution of pseudo GPAs for S1 in-person students by their S2 instructional mode. Students who opted to move to S2 virtual learning were more likely to be students with lower pseudo GPAs.

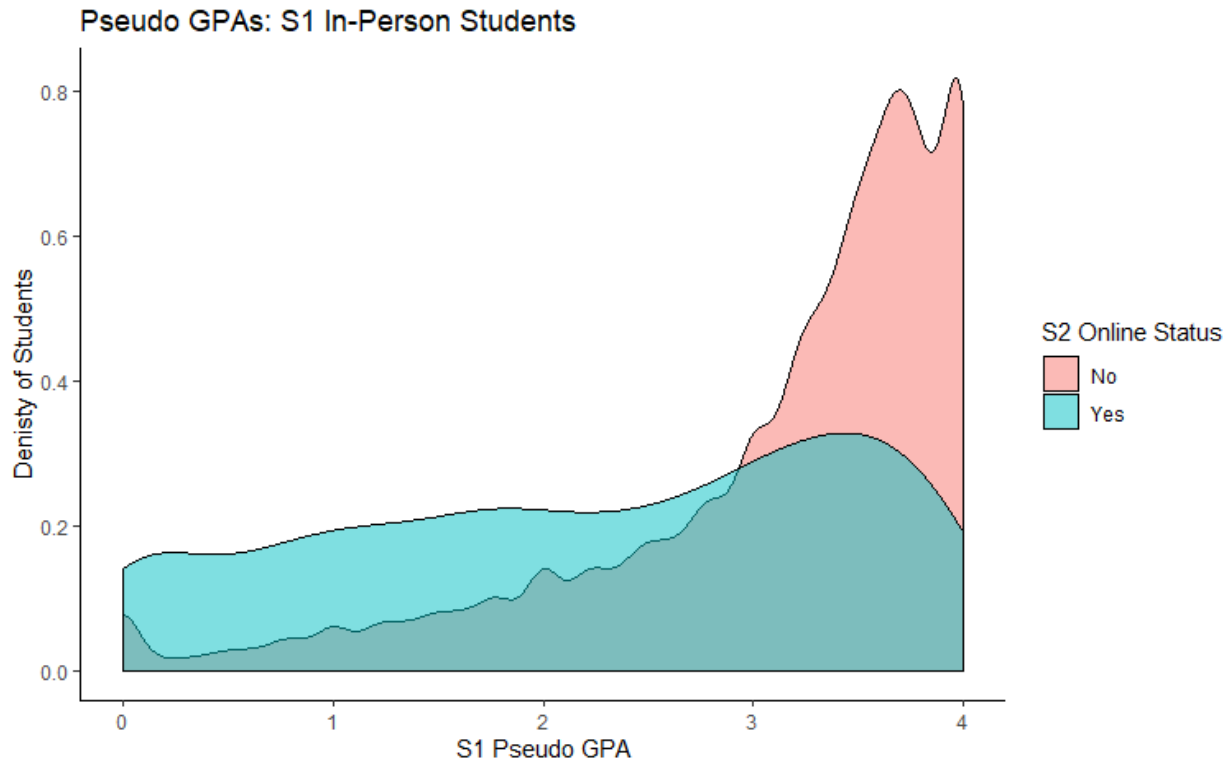


Figure 6: S1 Pseudo GPA for S1 In-Person Learners

Results: Student Discipline

The number of discipline incidents and suspensions during S1 vary significantly based on the students' learning mode. Tables 13 and 14 indicate that virtual students rarely have a discipline incident or suspension recorded in ASEPN even though the students who opted for virtual learning were more likely to have a discipline incident and/or suspension during SY1920. REA hypothesizes that the differences in virtual student behavior, changes in the types of virtual student-to-student interaction, and possibly the consequences for virtual infractions make comparisons difficult between learning modes. Though REA discourages comparison of incident and suspension data between learning modes, comparisons can be made within S1 learning modes.

Table 13: Discipline Data by Learning Mode

S1 Mode	% of Students w/ Discipline Incidents	% Students w/ Incident who are S2 Online	% Students w/ Incident who are S2 in-Person
Online	2%	1%	2%
In-Person	10%	21%	9%

Table 14: Suspension Data by Learning Mode

S1 Mode	% of Students w/ Suspension	% Students Suspended who are S2 Online	% Students Suspended who are S2 In-Person
Online	<1%	<1%	<1%
In-Person	3%	8%	2%

During S1, 10% of in-person students had a discipline incident recorded in ASPEN. Twenty-one percent (21%) of the students who were in-person for S1 but opted into S2 virtual learning had a discipline incident recorded in ASPEN (compared to 9% of S1 in-person learners who will be in-person learners in S2). A similar trend is observed in the suspension data, where 8% of the S1 in-person students who are moving to S2 virtual learning were suspended (compared to 3% of all S1 in-person learners, and 2% of S1 in-person learners who opted into S2 in-person learning).

Results: Student Attendance

Although data suggested that students who opted for online learning during S1 were more likely to be absent in SY1920, SY2021 S1 online students have a significantly higher median attendance rate (median = 99%) than their in-person peers (median = 97%, Figure 7). Forty-nine percent (49%) of S1 online learners had a reported attendance of 100% with 12% being chronically absent. Twenty-three percent (23%) of in-person learners had a reported attendance of 100% with 16% being chronically absent.

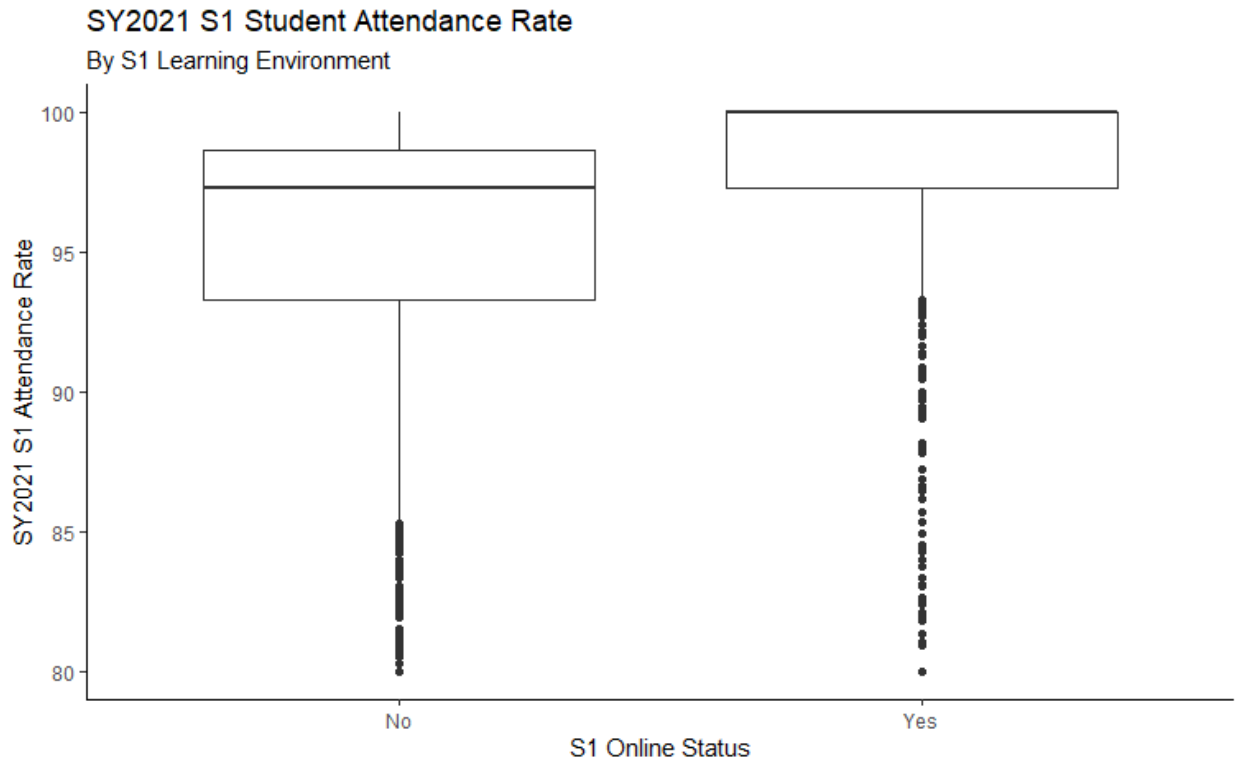


Figure 7: S1 Attendance Rates; S1 In-Person Learners vs. S1 Online Learners

Figures 8 and 9 indicate that the students who changed learning modes for S2 had lower median attendance compared to students who retained their S1 learning mode.

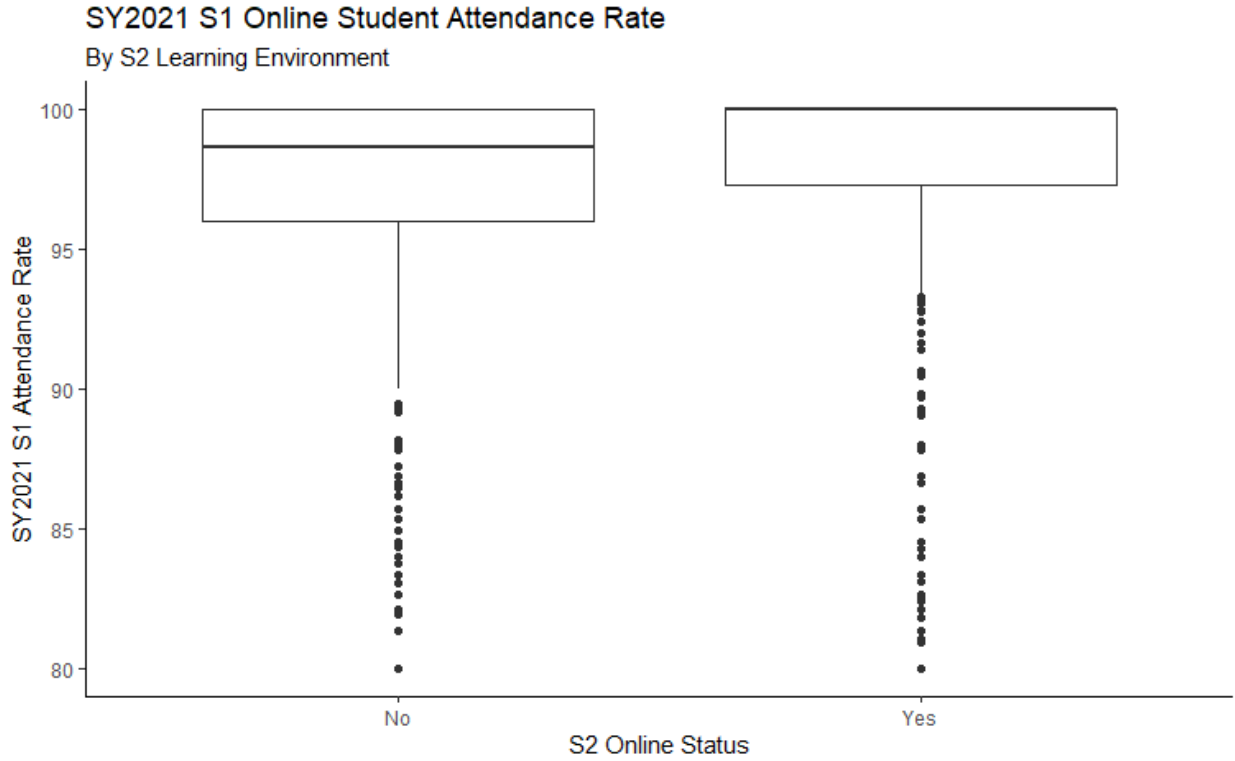


Figure 8: Attendance Rates for S1 Online Learners by S2 Learning Mode

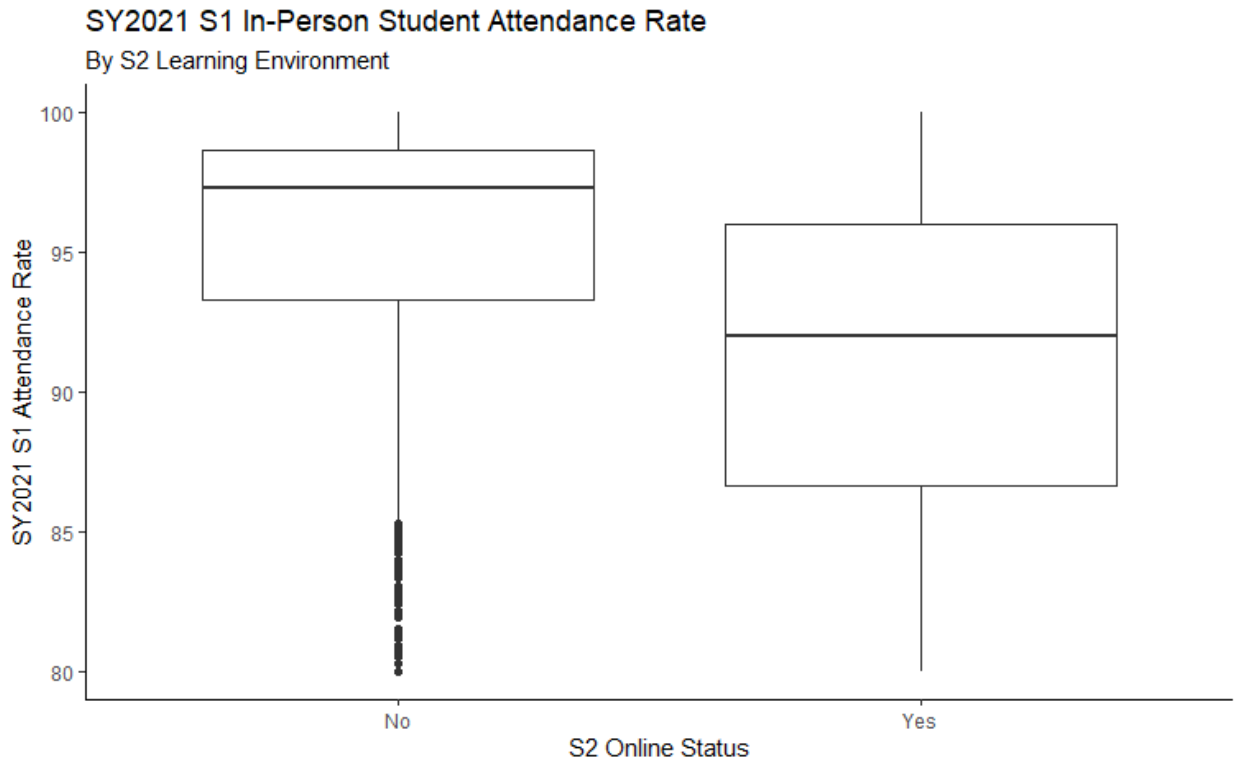


Figure 9: Attendance Rates for S1 In-Person Learners by S2 Learning Mode

Conclusions & Considerations

The story of the second semester appears to be one of change. Students opting into different learning modes during the second semester (from virtual to in-person and in-person to virtual) necessitated changes in how students were assigned to teachers. Although changing student-teacher assignments within the school year is a common (historical) practice among KCS high school students, in SY2021 elementary and middle school students are experiencing these changes at a radically different rate.

The in-person instructional environment and the QuEST program are the instructional modes most likely to be impacted by S2 transitions. The influx of students returning to in-person learning (from S1 virtual learning) prompted many schools to convert S1 base-school virtual instructors to S2 in-person instructors. In addition to building relationships with a new group of students, these converted in-person teachers also had to re-adjust to face-to-face teaching after a semester of online-only instruction. As base-school virtual instructors were converted to in-person instructors, students who opted to remain online were largely re-allocated to the QuEST program. The level of (between-semester) turnover within the QuEST program exceeds the annual turnover of the most at-risk schools within the district. Negative student-level impacts seem more likely when high student turnover is coupled with a relatively inexperienced teaching corps (as is evident among synchronous elementary QuEST teachers (Sattler 2020)) or asynchronous instruction among younger secondary students (as occurs in the middle school QuEST program).

The data suggests that students who opted to change their S2 learning mode, perhaps unsurprisingly, appear to have struggled in their S1 mode. The students who opted to change learning modes were more likely to have lower grades, more likely to have a recorded discipline incident, and more likely to have been suspended than their peers who did not change learning modes. Is this related to a student's fit in a specific learning environment, relationships between students and teachers specific to learning modes, or other reasons? Although we can identify the relevant trends in the data, we cannot isolate the causal factors that prompt students to seek a change in instructional mode.

Despite these changes, the demographics of the students opting for in-person and virtual learning seem to be relatively consistent between semesters. The proportion of students in online and in-person modes by race/ethnicity and state accountability subgroup (ED, ELL, SPED) appear to be relatively unaffected by the S1 to S2 shifts.

Aggregating information for this report highlighted some of the current challenges associated with data quality. Past membership in the virtual or in-person environment is overwritten whenever a change occurs. Because of this, there is no way to determine which students have ever been enrolled in the virtual environment. We can only know which

students are enrolled in the virtual learning environment at the current time. The mobility rate between virtual and in-person environments within a semester cannot be determined with the information available in ASPEN. Anecdotal evidence from the KCS information technology (IT) department suggests that within-semester mobility was significant. If within-semester virtual mobility information is important to district-level policymakers, KCS should consider capturing participation in virtual learning with a program code. Using program codes would create date-stamped documentation of any changes in learning environments. However, using program codes would require more time, effort, and training among the school-based staff entering the data into ASPEN.

Our current schedule data also cannot be used to precisely connect S2 student courses to learning mode. During S1, audits of the schedule could validate the accuracy of the “Virtual Learner Y/N” value in ASPEN. However, to minimize the number of changes to student schedules, schools may not always reschedule a virtual course to an in-person course when the student changes instructional modes. Because of this, all data associated with a specific learning mode should be treated with some level of skepticism.

Additionally, as S1 progressed, some secondary teachers opted to incorporate more synchronous elements into their virtual classes. Some specialized courses (such as advanced foreign language, International Baccalaureate, and Advanced Placement courses) were even conducted entirely synchronously. Unfortunately, there is no formal data to indicate if a course was taught synchronously, asynchronously, or as a synchronous/asynchronous hybrid. We cannot determine how prevalent synchronous content is, nor will we be able to effectively correlate synchronous/asynchronous environments with student outcomes.

The data also provides evidence that our typical conventions related to discipline and attendance apply differently to virtual learners. This is especially worrying at the high-school level, where early warning detection systems (EWDSs) incorporate attendance and discipline data to classify a student’s intervention potential. The data suggests that the range of attendance and discipline rates is strongly influenced by a student’s chosen instruction mode. EWDS calculation procedures may need to be updated to better reflect the realities of the virtual environment.

As the district continues to emphasize equity between students, we must make sure that our processes and procedures to monitor equity imbalance are accurate. District policymakers need to identify the key data used to monitor progress towards our strategic goals and ensure these data accurately capture progress in each learning environment.

Appendix 1

School	NCES School Type	S1 Virtual		S2 Virtual		Difference
		n	%	n	%	S2% - S1%
West View Elementary	City: Midsize	80	39%	29	14%	-25%
Chilhowee Intermediate	City: Midsize	70	40%	29	17%	-23%
Knox Adaptive Ed. Center	City: Midsize	25	38%	10	16%	-22%
Dogwood Elementary	City: Midsize	209	42%	98	20%	-22%
Sterchi Elementary	City: Midsize	105	30%	30	9%	-21%
Career Magnet Academy	City: Midsize	146	56%	86	36%	-21%
Shannondale Elementary	City: Midsize	120	32%	45	12%	-20%
L & N Stem Academy	City: Midsize	282	48%	164	28%	-20%
Richard Yoakley Alt	City: Midsize	10	21%	1	2%	-20%
Belle Morris Elementary	City: Midsize	153	36%	76	18%	-18%
Sunnyview Primary	Rural: Fringe	73	32%	33	13%	-18%
Bearden Middle School	City: Midsize	543	42%	313	25%	-18%
Beaumont Magnet	City: Midsize	265	45%	161	28%	-17%
Gap Creek Elementary	Rural: Fringe	20	28%	8	11%	-17%
Maynard Elementary	City: Midsize	54	41%	33	25%	-16%
West Haven Elementary	City: Midsize	110	33%	58	17%	-16%
Sarah Moore Greene Magnet	City: Midsize	226	41%	143	26%	-15%
New Hopewell Elementary	Rural: Fringe	56	26%	23	11%	-15%
Spring Hill Elementary	City: Midsize	165	36%	97	21%	-15%
Norwood Elementary	City: Midsize	180	37%	107	22%	-15%
Pond Gap Elementary	City: Midsize	120	34%	67	19%	-15%
East Knox County Elementary	Rural: Fringe	137	30%	75	16%	-14%
Hardin Valley Middle School	Suburb: Large	357	36%	216	22%	-14%
South Doyle High School	Suburb: Large	392	37%	243	24%	-14%
Green Magnet Academy	City: Midsize	115	33%	69	20%	-13%
Whittle Springs Middle	City: Midsize	234	46%	167	32%	-13%
Holston Middle School	City: Midsize	248	44%	175	31%	-13%
Adrian Burnett Elem	Suburb: Large	127	25%	63	12%	-13%
South Knoxville Elementary	City: Midsize	57	36%	35	23%	-13%
West Hills Elementary	City: Midsize	231	33%	145	21%	-13%
Vine Middle Magnet	City: Midsize	280	54%	212	41%	-13%
Inskip Elementary	City: Midsize	173	35%	106	23%	-13%
Fulton High School	City: Midsize	372	40%	252	28%	-13%
Christenberry Elementary	City: Midsize	140	31%	84	18%	-12%
Ball Camp Elementary	Suburb: Large	161	30%	99	18%	-12%
Amherst Elementary	Suburb: Large	178	27%	102	15%	-12%

Bearden Elementary	City: Midsize	101	31%	63	20%	-12%
Emerald Academy	City: Midsize	175	40%	103	28%	-12%
Sequoyah Elementary	City: Midsize	84	19%	31	7%	-12%
Lonsdale Elementary	City: Midsize	65	22%	31	10%	-12%
Pleasant Ridge Elementary	City: Midsize	67	23%	33	11%	-12%
Mooreland Hts. Elementary	City: Midsize	85	32%	54	21%	-12%
Northwest Middle School	City: Midsize	348	42%	248	30%	-11%
Hardin Valley Elementary	Suburb: Large	334	28%	199	17%	-11%
Rocky Hill Elementary	City: Midsize	199	27%	114	16%	-11%
Gresham Middle School	City: Midsize	349	43%	258	31%	-11%
Karns Middle School	Suburb: Large	331	35%	227	24%	-11%
Gibbs Elementary	Suburb: Large	185	21%	88	10%	-11%
West Valley Middle School	Suburb: Large	393	33%	264	22%	-11%
Austin East High School	City: Midsize	317	40%	230	30%	-11%
Farragut Intermediate	Suburb: Large	397	38%	287	27%	-11%
Brickey-Mccloud Elementary	Suburb: Large	205	24%	113	13%	-11%
Copper Ridge Elementary	Rural: Fringe	105	23%	59	13%	-10%
Farragut Middle School	Suburb: Large	479	35%	342	25%	-10%
Farragut High School	Suburb: Large	702	35%	494	25%	-10%
Powell Elementary	Suburb: Large	196	25%	116	15%	-10%
Halls High School	Suburb: Large	365	28%	232	18%	-10%
Karns Elementary School	Suburb: Large	377	31%	250	21%	-10%
Northshore Elementary	City: Midsize	287	28%	189	18%	-10%
Blue Grass Elementary	Suburb: Large	166	32%	116	22%	-9%
Halls Elementary	Suburb: Large	131	19%	66	9%	-9%
A.L. Lotts Elementary	Suburb: Large	316	33%	224	23%	-9%
Gibbs Middle School	Suburb: Large	124	21%	69	12%	-9%
Ritta Elementary	Rural: Fringe	149	27%	101	18%	-9%
Bonny Kate Elementary	Suburb: Large	66	20%	37	11%	-9%
Powell Middle School	Suburb: Large	272	31%	196	22%	-9%
Mount Olive Elementary	Suburb: Large	42	20%	24	11%	-9%
Farragut Primary	Suburb: Large	280	31%	206	22%	-9%
Cedar Bluff Elementary	Suburb: Large	336	28%	245	20%	-8%
Bearden High School	City: Midsize	659	32%	487	23%	-8%
Fountain City Elementary	City: Midsize	113	32%	86	24%	-8%
Halls Middle School	Suburb: Large	299	28%	213	20%	-8%
Carter Middle School	Rural: Fringe	199	33%	153	25%	-8%
Sam E. Hill Primary School	City: Midsize	30	15%	15	7%	-8%
Hardin Valley Academy	Suburb: Large	644	31%	478	23%	-8%
Carter Elementary	Rural: Fringe	135	26%	99	18%	-8%
Cedar Bluff Middle School	Suburb: Large	221	36%	179	30%	-7%

Karns High School	Suburb: Large	452	32%	348	26%	-6%
Corryton Elementary	Rural: Fringe	40	19%	26	13%	-6%
South Doyle Middle School	City: Midsize	306	37%	251	31%	-6%
Carter High School	Rural: Fringe	224	27%	170	21%	-6%
Powell High School	Suburb: Large	400	30%	319	24%	-6%
Central High School	City: Midsize	441	34%	361	29%	-6%
West High School	City: Midsize	454	30%	374	25%	-5%
Gibbs High School	Suburb: Large	222	21%	154	15%	-5%
Ridgedale Alternative	City: Midsize	2	5%	1	2%	-3%
Fair Garden Fam/Comm Ctr	City: Midsize	0		0		-
Ft Sanders Ed Dev Ctr	City: Midsize	0		0		-
Paul L. Kelley Volunteer	City: Midsize	0		0		-

Appendix 2

School	n S2 Virtual Learners	n S2 QuEST	% S2 QuEST	% S1 QuEST	Change % Quest (S2-S1)
Corryton Elementary	26	26	100%	100%	0%
Gibbs Middle School	69	69	100%	43%	57%
Lonsdale Elementary	31	31	100%	23%	77%
New Hopewell Elementary	23	23	100%	100%	0%
Pleasant Ridge Elementary	33	33	100%	42%	58%
Richard Yoakley Alt	1	1	100%	100%	0%
Sterchi Elementary	30	30	100%	2%	98%
Sunnyview Primary	33	33	100%	15%	85%
Gibbs High School	154	146	95%	90%	5%
Mount Olive Elementary	24	21	88%	69%	18%
Bearden High School	487	416	85%	54%	31%
Halls High School	232	197	85%	82%	3%
Shannondale Elementary	45	38	84%	6%	79%
West View Elementary	29	23	79%	20%	59%
Bonny Kate Elementary	37	29	78%	52%	27%
Pond Gap Elementary	67	52	78%	31%	47%
Hardin Valley Academy	478	361	76%	50%	26%
South Doyle High School	243	171	70%	33%	38%
Central High School	361	251	70%	16%	54%
Farragut High School	494	341	69%	55%	14%
East Knox County Elementary	75	49	65%	9%	57%
Career Magnet Academy	86	54	63%	26%	37%
Gap Creek Elementary	8	5	63%	65%	-3%
Carter High School	170	102	60%	36%	24%
Powell High School	319	185	58%	7%	51%
Karns High School	348	188	54%	63%	-9%
South Knoxville Elementary	35	18	51%	39%	13%
Fulton High School	252	122	48%	29%	19%
West Haven Elementary	58	27	47%	3%	44%
Fountain City Elementary	86	39	45%	5%	40%
Northwest Middle School	248	109	44%	0%	44%
Halls Elementary	66	28	42%	5%	37%
Sequoyah Elementary	31	13	42%	35%	7%
Carter Middle School	153	57	37%	47%	-9%
Norwood Elementary	107	37	35%	11%	23%
Adrian Burnett Elem	63	21	33%	8%	25%
Carter Elementary	99	30	30%	9%	21%

School	n S2 Virtual Learners	n S2 QuEST	% S2 QuEST	% S1 QuEST	Change % Quest (S2-S1)
Belle Morris Elementary	76	23	30%	15%	15%
Cedar Bluff Middle School	179	53	30%	71%	-41%
Hardin Valley Middle School	216	63	29%	19%	10%
Beaumont Magnet	161	46	29%	14%	15%
Bearden Middle School	313	82	26%	32%	-6%
Gibbs Elementary	88	23	26%	17%	9%
Maynard Elementary	33	8	24%	0%	24%
Chilhowee Intermediate	29	7	24%	0%	24%
Christenberry Elementary	84	20	24%	15%	9%
L & N Stem Academy	164	39	24%	61%	-37%
West Valley Middle School	264	60	23%	14%	8%
Green Magnet Academy	69	15	22%	0%	22%
Karns Middle School	227	46	20%	24%	-4%
Knox Adaptive Ed. Center	10	2	20%	4%	16%
South Doyle Middle School	251	45	18%	23%	-5%
Holston Middle School	175	30	17%	6%	11%
Austin East High School	230	38	17%	20%	-3%
Inskip Elementary	106	17	16%	8%	8%
Amherst Elementary	102	16	16%	16%	-1%
Mooreland Hts Elementary	54	8	15%	0%	15%
Gresham Middle School	258	38	15%	9%	6%
Vine Middle Magnet	212	31	15%	10%	4%
West High School	374	53	14%	65%	-51%
Spring Hill Elementary	97	13	13%	14%	-1%
Blue Grass Elementary	116	15	13%	14%	-2%
Brickey-Mccloud Elementary	113	11	10%	7%	2%
Farragut Middle School	342	33	10%	11%	-2%
Halls Middle School	213	18	8%	9%	-1%
Sarah Moore Greene Magnet	143	12	8%	0%	8%
Whittle Springs Middle	167	13	8%	12%	-4%
Powell Elementary	116	9	8%	8%	0%
Powell Middle School	196	15	8%	0%	8%
Cedar Bluff Elementary	245	17	7%	8%	-1%
Ritta Elementary	101	7	7%	11%	-4%
Copper Ridge Elementary	59	4	7%	7%	0%
Ball Camp Elementary	99	5	5%	9%	-4%
Karns Elementary School	250	9	4%	5%	-2%
A.L. Lotts Elementary	224	8	4%	3%	0%
Hardin Valley Elem	199	7	4%	5%	-2%

School	n S2 Virtual Learners	n S2 QuEST	% S2 QuEST	% S1 QuEST	Change % Quest (S2-S1)
Bearden Elementary	63	2	3%	3%	0%
West Hills Elementary	145	4	3%	6%	-4%
Rocky Hill Elementary	114	3	3%	5%	-2%
Farragut Intermediate	287	2	1%	1%	-1%
Farragut Primary	206	1	0%	1%	-1%
Dogwood Elementary	98	0	0%	0%	0%
Emerald Academy	103	0	0%	0%	0%
Northshore Elementary	189	0	0%	0%	0%
Ridgedale Alternative	1	0	0%	0%	0%
Sam E. Hill Primary School	15	0	0%	0%	0%