Alternative Instructional Methods Study

Student Outcomes Across Instructional Delivery Types

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Data Engineer, EOC

SC EDUCATION OVERSIGHT COMMITTEE

Reporting facts. Measuring change. Promoting progress.

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School Year 2024-2025

SC READY Grades 3-8 | EOCEP High School Courses

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Contents

1. Executive Summary

This study examines student outcomes across instructional delivery types in South Carolina public schools during the 2024-25 school year. It covers 183,612 students in grades 7 to 12 with End-of-Course Examination Program (EOCEP) eligible course enrollments in Algebra 1, English 2, Biology 1, and U.S. History, including some grade 7 and 8 students taking these courses early, and 313,727 students in grades 3 to 8 assessed through SC READY in English Language Arts (ELA) and Math. The delivery types compared are Face-to-Face, VirtualSC, District Virtual, Out-of-State Virtual, Hybrid, Distance Learning, and Unknown, a label used when the enrollment records do not identify how a course was delivered. Achievement results are based on students with a recorded test score. Test participation is examined separately; EOCEP participation is counted at the student-subject level.

Table 1. Instructional Delivery Type Definitions

Instructional Delivery Type	Definition
Face-to-Face	Teacher is physically present in the classroom providing in-person instruction to students (also referred to as Instructor Led or Instruction Type = A in PowerSchool).
VirtualSC*	Teacher provides instruction to students through the VirtualSC program (also referred to as SC Virtual School Program or Instruction Type = B in PowerSchool).
District Virtual*	Virtual instruction is provided by a teacher as part of an SC school/district/state entity (also referred to as Online In-State or Instruction Type = C in PowerSchool).
Out-of-State Virtual*	The teacher who provides instruction to students is not part of an SC school/district/state (also referred to as Online Out-of-State or Instruction Type = E in PowerSchool). This includes any course that is provided by a vendor (e.g., EdOptions, Edmentum, Florida Virtual).
Hybrid*	The teacher provides in-person and virtual instruction in some capacity as part of an SC school/district/state entity (also referred to as Instruction Type = F in PowerSchool). When the in-person instructional time does not meet the seat time requirement for the initial offering of a credit-bearing course, the section should be marked as Hybrid. This is not referring to dual modality.
Distance Learning*	The teacher provides instruction for students physically located at another school location. For example, the teacher may be located physically at a television studio, yet teaching several groups of students housed in different schools or districts.
Unknown	The instruction type is unknown and the enrollment records do not identify how a course was delivered.

*Denotes Alternative Instruction Method. For more information, see Student Information System (SIS) Data Entry Manual.

Principal Findings

EOCEP pass rates are substantially lower for District Virtual and Hybrid students, with the largest differences in Algebra 1. In Algebra 1, 55.4 percent of Face-to-Face students passed, against 20.2 percent of District Virtual students and 17.4 percent of Hybrid students. Every subject

shows a gap of this kind. Algebra 1 is also where delivery type is most strongly connected to scores, associated with 3.9 percent of score variation, the largest share in the study.

The large differences remained after accounting for school, grade, semester, and poverty. Depending on the subject, adjusted pass rates for District Virtual students were 18.9 to 32.1 percentage points lower than for Face-to-Face students; for Hybrid students, 20.3 to 35.3 points lower. These are strong associations, not proof that delivery type caused the differences.

Poverty is strongly related to achievement, but it does not account for the delivery-type differences. The instructional groups serve different populations: pupils in poverty make up 57.9 percent of tested Face-to-Face EOCEP records, 69.7 percent of Hybrid, 83.0 percent of VirtualSC, and 86.6 percent of Distance Learning. Yet the delivery gaps hold when students are compared within the same poverty group, and in models that account for poverty. Poverty carries its own weight too: adjusted pass rates run 11.4 to 21.2 percentage points lower for pupils in poverty, depending on the subject.

EOCEP participation is an important limitation for VirtualSC. Only 224 of 710 VirtualSC student-subject enrollments, 31.5 percent, have a recorded EOCEP score; the Face-to-Face figure is 96.2 percent. The available data do not show why the remaining records have no score, so VirtualSC's EOCEP results describe only the subset with a recorded score. SC READY shows nothing similar: there, VirtualSC participation is 96 percent or higher in both subjects.

Unknown is a data-quality category, not an instructional method. In EOCEP, ten districts account for 86.1 percent of the 61,203 enrollment records with no reported delivery type; Greenville 01 alone accounts for about 42 percent. In SC READY, about 11 percent of student-subject assignments are Unknown, either because the delivery type is missing or because no course for the subject is on file. In the fully adjusted EOCEP models, Unknown is not statistically different from Face-to-Face in any subject. In SC READY, its large raw advantage shrinks to about 1 point higher in ELA and 2 points lower in Math once prior achievement is taken into account, differences that are very small in practical terms. The Unknown category is not used to draw conclusions about instructional delivery.

In grades 3 to 8, after controlling for prior achievement, students receiving alternative instruction methods underperform compared to students who started at the same score, particularly in Math. District Virtual students scored about 24 points lower in Math and 11 points lower in ELA than Face-to-Face students with the same prior-year score and grade; Hybrid students scored about 23 and 8 points lower, respectively. Adding poverty as a covariate changed these estimates very little. In the raw results, the ELA gap between Face-to-Face and District Virtual is essentially gone by grade 8, while the Math gap remains substantial at every grade.

Readers should note that this study is observational. Students are not randomly assigned to instructional delivery types, so the findings are associations rather than causal effects. SC READY provides a prior-year achievement control for grades 4 to 8; EOCEP has no comparable prior-year test, so its models compare students within schools while accounting for grade, semester the test was taken, and poverty. Full limitations are in Section 5. The recommendations in Section 6 focus on improving delivery-type reporting, investigating the VirtualSC participation gap, giving particular attention to Math and Algebra 1, and comparing like with like when judging delivery types.

2. Study Context, Scope, and Objectives

This study examines student academic performance in South Carolina public schools in the 2024-25 school year across multiple instructional settings, including traditional in-person classes, VirtualSC, district and out-of-state online courses, hybrid instruction, and distance learning options. School districts record the instructional delivery type on each course enrollment when reported, allowing comparison of student outcomes by setting.

The primary objective is to assess differences in student outcomes by instructional delivery type and determine if these differences remain after adjusting for prior academic performance, poverty status, grade level, school context, and semester the test was taken. The study also examines whether these patterns are consistent across subjects, grade levels, and poverty groups.

The analysis focuses on five main questions:

1. Which students participate in each instructional delivery type, and how do these groups differ, particularly regarding poverty status?
2. How do student academic outcomes compare across instructional delivery types?
3. Do differences in student outcomes persist after accounting for prior achievement, poverty, grade, school context, and semester the test was taken, where available?
4. Are these patterns consistent across subjects, grade levels, and student groups defined by poverty status?
5. What data quality or reporting issues should be considered when interpreting the results?

The study focuses on two assessment groups: the End-of-Course Examination Program (EOCEP), covering Algebra 1, English 2, Biology 1, and U.S. History for 183,612 students in grades 7 to 12 (grade 7 and 8 test takers are middle school students taking these courses early), and SC READY, which measures English language arts (ELA) and Math for 313,727 students in grades 3 to 8. Course enrollment records indicate instructional delivery type, assessment records provide student outcomes, and 2025 Report Card data identify pupil-in-poverty (PiP) status.

For analysis, each student's coursework is classified into one instructional delivery type per subject. Every result in this report is based on that one-record-per-student-per-subject approach. For EOCEP, the classification reflects the delivery type of the student's courses in the tested subject. For SC READY, ELA and Math are classified separately, each from that subject's own courses. Some middle school students take an EOCEP course early, typically Algebra 1. Those courses appear in the high school enrollment file, so both course files are used in the classification.

Students are grouped as Unknown when enrollment records do not provide enough information to identify how the course was delivered. For SC READY, this may occur because a subject course has no reported delivery type or because no course is found for that subject. For EOCEP, it usually means the course is present, but the delivery type is missing. Unknown is treated as a data-quality category, not as an instructional method.

For EOCEP, passing is defined as performance level A, B, or C. To protect student privacy and ensure reliability, results are not reported for groups with fewer than 20 tested students. Appendix C provides additional details on data preparation, instructional type assignment, statistical methods, and sensitivity analyses.

3. Findings: EOCEP High School Courses

Finding 1: District Virtual and Hybrid students have lower pass rates in all four EOCEP subjects, with the largest gaps in Algebra 1

EOCEP pass rates differed sharply by instructional delivery type. In Algebra 1, 55.4 percent of Face-to-Face students passed, compared to 20.2 percent of District Virtual and 17.4 percent of Hybrid students. Only 2.2 percent of the 45 VirtualSC students with an Algebra 1 score passed. These students are the minority of VirtualSC enrollees who tested at all (Finding 4). Algebra 1 had the largest pass rate differences, while English 2 had the smallest. Biology 1 and U.S. History fell in between (Figure 1, Table 2). The Unknown group is a reporting category rather than an instructional method and is examined separately in Finding 5.

Statistical testing confirms real differences among delivery types in every subject and in 47 of the 55 head-to-head comparisons between pairs of delivery types. The pattern is not an Algebra problem; it is present in all four subjects. Virtual and hybrid students pass at substantially lower rates across the board. In English 2, the narrowest case, Face-to-Face students pass at 72.7 percent, compared with 50.4 percent for Hybrid. In Biology 1 and U.S. History, District Virtual and Hybrid students pass at roughly half the Face-to-Face rate. Algebra 1 shows the most extreme pattern. It is also the subject where delivery type is most strongly connected to scores overall, associated with 3.9 percent of score variation. Test details and full results are in Appendix Table A3.

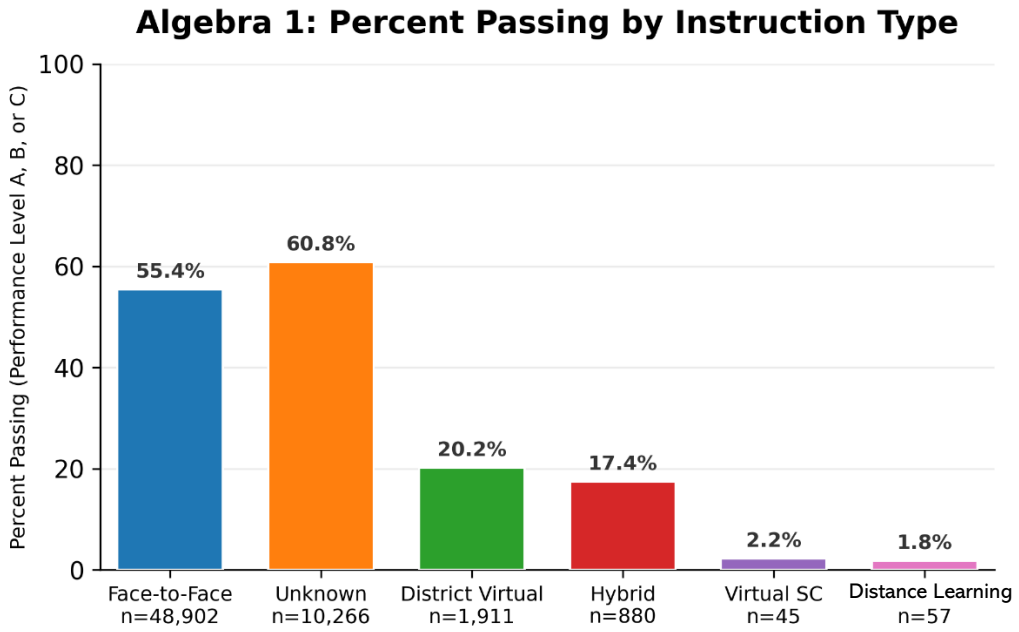
Table 2. Percent passing by subject and instruction type, among tested students

Instruction Type	Algebra 1	English 2	Biology 1	U.S. History
Face-to-Face	55.4	72.7	47.0	49.5
Unknown	60.8	69.6	48.7	48.9
District Virtual	20.2	60.9	27.1	26.8
Hybrid	17.4	50.4	19.3	20.1
VirtualSC	2.2	9.7	24.1	11.6
Distance Learning	1.8	29.6	0.0	*
Out-of-State Virtual	*	*	*	*

** Fewer than 20 tested students, suppressed. Tested counts and mean scale scores: Appendix Tables A1 and A2.*

Figure 1. Algebra 1 pass rates are much lower for District Virtual and Hybrid students

Companion charts for the other three subjects: Appendix Figures A1 to A3.



Note: Among tested students; n = tested students in the group. Formats with fewer than 20 tested students are not shown. Virtual SC results describe its tested minority (31.5 percent of enrollees).

Finding 2: Large differences remain after accounting for school, grade level, semester, and poverty

Even after adjusting for school, grade level, semester the test was taken, and student poverty, substantial differences in EOCEP pass rates remained. In Algebra 1, District Virtual students had an adjusted pass rate 32.1 percentage points lower than Face-to-Face students, while Hybrid students were 23.2 points lower. For VirtualSC students with an Algebra 1 score, the adjusted pass rate was 48.1 percentage points lower. Because fewer VirtualSC students took the EOCEP test, this estimate applies only to those with a recorded test score (Finding 4).

Similar gaps appeared in the other EOCEP subjects. District Virtual pass rates were 18.9 to 32.1 percentage points lower than Face-to-Face, while Hybrid pass rates were 20.3 to 35.3 points lower. VirtualSC also had lower adjusted pass rates in three subjects, with the largest difference in English 2 at 59.2 percentage points. In Biology 1, the VirtualSC estimate was not statistically different from Face-to-Face because of the uncertainty around the estimate (Figure 2, Table 2). Unknown did not differ statistically from Face-to-Face in any of the four subjects after adjustment. Given that Unknown represents records where instructional delivery could not be identified, it should not be interpreted as a separate instructional method (Finding 5).

Accounting for school, grade level, semester the test was taken, and poverty did not eliminate the differences in pass rates. Those factors therefore do not explain the gaps on their own. Other differences between students may still be present in the data but not measured in the analysis. For that reason, the findings show a persistent relationship between instructional delivery type and pass rates, but they do not show that delivery type caused the differences. In this analysis, VirtualSC refers to students enrolled in regular public schools who take classes through the state virtual program. These students are not enrolled in virtual charter schools.

To ensure reliable comparisons, model results are reported only when a group includes enough schools and tested students. Face-to-Face, Unknown, District Virtual, Hybrid, and VirtualSC met

this requirement. Out-of-State Virtual did not, and Distance Learning met it only for Algebra 1. Additional details are provided in Appendix Table A5.

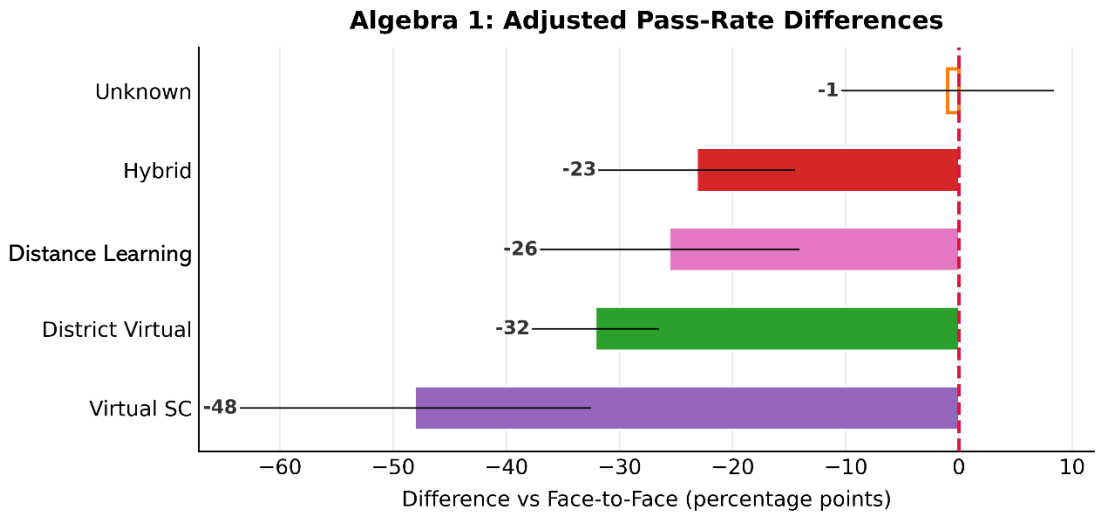
Table 2. Adjusted differences in passing, poverty adjusted (percentage points versus Face-to-Face, within school, grade level, and testing window)

Model Term	Algebra 1	English 2	Biology 1	U.S. History
District Virtual	-32.1	-26.7	-18.9	-19.2
Hybrid	-23.2	-28.9	-35.3	-20.3
VirtualSC	-48.1	-59.2	-17.7 (ns)	-30.6
Distance Learning	-25.6	*	*	*
Unknown	-1.0 (ns)	+0.9 (ns)	+11.3 (ns)	+2.3 (ns)
Pupils in poverty (within school and type)	-11.4	-13.3	-20.0	-21.2

*Linear probability models; school, grade, and test administration window fixed effects; school-clustered standard errors; ns = not significant. Estimates from groups spanning too few schools within a subject are excluded per the reliability standard described in Appendix Table A5. Confidence intervals are reported in Appendix Table A5. * = reliability standard not met in that subject.*

Figure 2. Adjusted differences in Algebra 1 pass rates by instructional delivery type

Percentage-point differences versus Face-to-Face after adjusting for school, grade, test administration window, and poverty. Whiskers show 95% confidence intervals; open bars indicate estimates that are not statistically distinguishable from Face-to-Face.



Finding 3: Poverty is strongly related to EOCEP outcomes but does not account for the delivery-type gaps

Poverty rates vary across instructional settings. Among tested EOCEP records, pupils in poverty accounted for 57.9 percent of Face-to-Face records, 69.7 percent of Hybrid, 83.0 percent of VirtualSC, and 86.6 percent of Distance Learning (Appendix Table A6). If poverty accounted for the observed delivery differences, those gaps should narrow substantially within poverty groups. They do not.

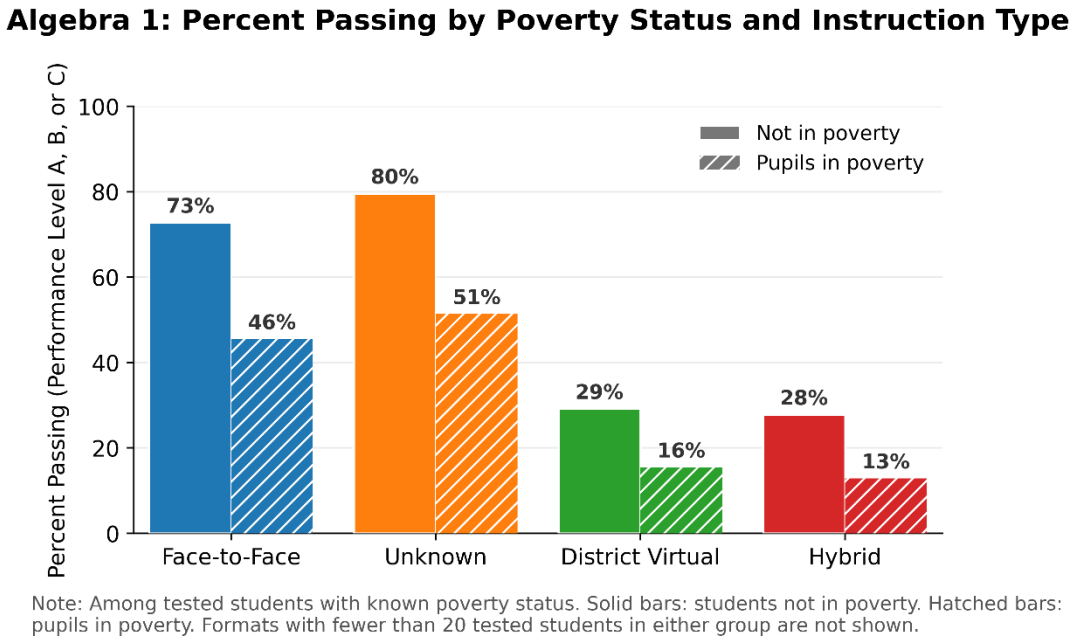
In Algebra 1, 45.5 percent of Face-to-Face students in poverty passed, compared with 15.5 percent of District Virtual students and 12.9 percent of Hybrid students. Among students not in poverty, the corresponding pass rates were 72.8 percent for Face-to-Face, 29.2 percent for District Virtual, and 27.8 percent for Hybrid (Figure 3). The same general pattern appears in the other EOCEP subjects (Appendix Figures A7 to A9).

Adjusted models show similar results. Estimates with and without poverty adjustment generally differ by less than three points for the larger groups, and by up to about five points for VirtualSC (Appendix Tables A4 and A5). Therefore, higher poverty concentrations do not explain the delivery-type differences. However, poverty remains strongly associated with EOCEP performance: after controlling for school, grade, semester the test was taken, and delivery type, students in poverty had pass rates 11.4 to 21.2 percentage points lower, depending on the subject. This association is strongest in Biology 1 and U.S. History, while Algebra 1 showed the strongest overall relationship between instructional delivery type and performance.

Poverty matters, but it does not explain the differences across instructional delivery types. The gaps remain after accounting for poverty.

Figure 3. Algebra 1 pass rates differ by both poverty status and instructional delivery type

Percent passing by poverty status within instructional delivery type. Results for other EOCEP subjects are shown in Appendix Figures A7 to A9; detailed results are in Appendix Table A7.



Note: Among tested students with known poverty status. Solid bars: students not in poverty. Hatched bars: pupils in poverty. Formats with fewer than 20 tested students in either group are not shown.

Finding 4: Only about one-third of VirtualSC enrollments have a recorded EOCEP score

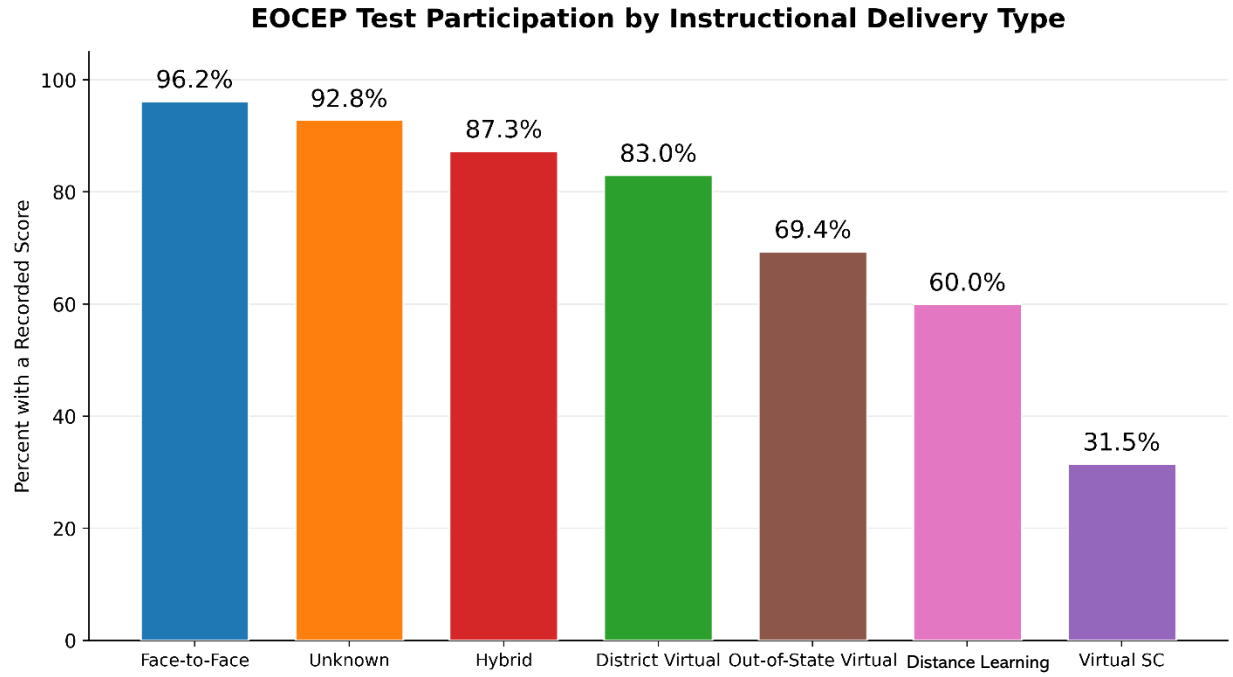
Before comparing EOCEP outcomes, test participation differs substantially across instructional delivery types. Counting one record per student per subject, Face-to-Face had the highest participation rate at 96.2 percent, followed by Unknown at 92.8 percent, Hybrid at 87.3 percent, and District Virtual at 83.0 percent. Participation was far lower for VirtualSC: of 710 student-subject enrollments, only 224 (31.5 percent) had a recorded score (Figure 4, Appendix Table A1). Distance Learning and Out-of-State Virtual also had lower participation, but both groups were very small.

This matters when interpreting the VirtualSC results elsewhere in the report. Pass rates and score comparisons are based only on records with a test score. For VirtualSC, that means the results describe roughly one-third of its student-subject enrollment, not all VirtualSC coursework. The available data do not show why the remaining records have no score; course withdrawal, exemption, absence, and other reasons cannot be distinguished.

The low participation rate is specific to EOCEP. For SC READY, VirtualSC participation was 96 percent or higher in both ELA and Math, comparable to other major delivery groups (Appendix Table B1, Figure B7). Therefore, EOCEP participation is a key limitation when interpreting VirtualSC results.

Figure 4. EOCEP test participation is much lower for VirtualSC

Percent of student-subject records with a recorded EOCEP score, by instructional delivery type. Counts: Appendix Table A1.



Note: Percent of student-subject records with a recorded EOCEP score, SY 2024-25.

Finding 5: Unknown reflects missing reporting information, not an instructional method

Unknown does not represent a separate instructional method. In EOCEP, it mainly comes from course enrollment records where the instructional delivery type was not reported. About one in five EOCEP enrollment records lacked this information, and the missing reporting was heavily concentrated in a small number of districts. Ten districts accounted for 86.1 percent of the 61,203 uncoded EOCEP enrollment records. Greenville 01 alone accounted for about 42 percent; 98.6 percent of its own EOCEP enrollments were uncoded. Greenwood 50 and Marlboro 01 also had uncoded rates above 98 percent (Table 3).

Unknown has a somewhat different meaning in SC READY. About 11 percent of student-subject assignments were classified as Unknown, either because a subject course was listed without a delivery type or because no course for that subject could be found in the enrollment records. The no-course cases accounted for 5,075 ELA and 2,471 Math assignments, and these students scored well above average. This mix is why Unknown is treated as a data-quality category rather than as another instructional delivery type.

The results support this conclusion. In EOCEP, any differences associated with Unknown in the raw data disappear in the fully adjusted models: no subject shows a statistically meaningful gap between Unknown and Face-to-Face (Finding 2). SC READY shows a similar pattern. Unknown initially appears to have a large raw advantage, but after accounting for prior achievement, the difference nearly disappears, with Unknown about 1 point above Face-to-Face in ELA and 2 points below in Math. Although these small differences are statistically detectable due to the large sample sizes, they are very small in magnitude (Finding 6).

Overall, the reporting patterns and adjusted results indicate that Unknown outcomes primarily reflect missing delivery information and the characteristics of students in this category, rather than a distinct instructional approach. As a result, Unknown is reported throughout the analysis but is not used to draw conclusions about the relative performance of instructional delivery types. Section 6 recommends follow-up with districts where missing delivery reporting is concentrated.

Table 3. Districts with the largest numbers of uncoded EOCEP enrollment records

District	EOCEP enrollments	Uncoded	Percent of own enrollments uncoded
Greenville 01	26,184	25,824	98.6
York 03	8,952	7,410	82.8
Florence 01	4,632	4,047	87.4
Sumter 01	7,107	3,735	52.6
Greenwood 50	3,103	3,045	98.1
Cherokee 01	2,628	2,126	80.9
Aiken 01	7,909	2,050	25.9
Charleston 01	18,954	1,672	8.8
Horry 01	16,127	1,467	9.1
Marlboro 01	1,352	1,329	98.3

These ten districts account for 86.1 percent of all uncoded EOCEP enrollment records; 106 of 110 districts had at least some.

4. SC READY, Grades 3 to 8

Finding 6: Differences remain among students who started at the same score, especially in Math

One possible reason for the raw differences is that students in different instructional settings may have entered the year at different achievement levels. To account for this, the analysis linked grade 4 to 8 students to their prior-year SC READY scores and compared outcomes after adjusting for prior score and grade. Prior-year scores were available for 92 to 94 percent of students in each grade.

The differences remained after accounting for prior achievement. In Math, District Virtual students scored 23.8 points lower than Face-to-Face students with the same prior score and grade, and Hybrid students scored 22.5 points lower. Distance Learning students scored 28.5 points lower, although this estimate rests on a much smaller group, and the same group's ELA estimate is too imprecise to interpret. In ELA, the adjusted differences were smaller: 10.8 points lower for District Virtual and 8.0 for Hybrid. VirtualSC did not differ statistically from Face-to-Face in either subject among the students available for this analysis (Table 4, Figure 5). Unknown's large raw advantage nearly vanishes here as well, to about 1 point above Face-to-Face in ELA and 2 points below in Math, consistent with Finding 5's reading of the category.

Prior achievement alone does not account for the remaining differences. Adding poverty to the models changed the estimates by only tenths of a point, consistent with prior-year achievement

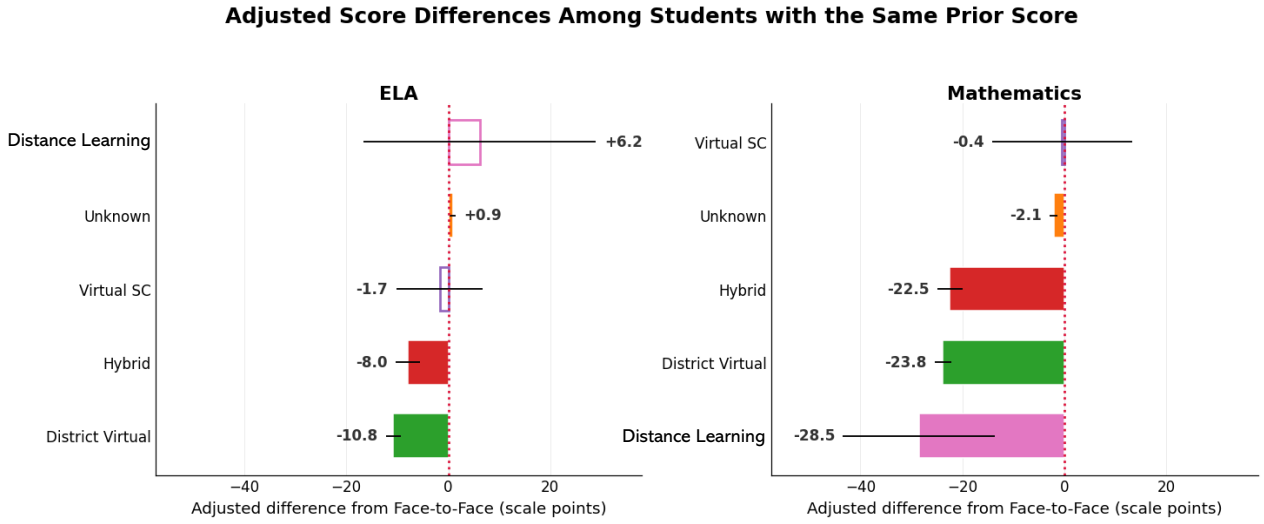
already capturing much of the difference associated with poverty (Appendix Table B4). The main differences therefore remain after accounting for both where students started academically and their poverty status.

Table 4. Adjusted differences in SY 2024-25 score among students with the same prior year score and grade (scale points versus Face-to-Face)

Instruction type	ELA adjusted difference	ELA 95% interval	Math adjusted difference	Math 95% interval
District Virtual	-10.8	-12.2 to -9.3	-23.8	-25.4 to -22.2
Hybrid	-8.0	-10.3 to -5.6	-22.5	-24.9 to -20.0
Distance Learning	+6.2 (ns)	-16.6 to +29.0	-28.5	-43.4 to -13.7
VirtualSC	-1.7 (ns)	-10.2 to +6.8	-0.4 (ns)	-14.1 to +13.4
Unknown	+0.9	+0.3 to +1.5	-2.1	-2.8 to -1.4

Analysis of covariance on 240,601 (ELA) and 240,834 (Math) Grade 4 to 8 students with a prior score; adjusts for prior score and grade; heteroskedasticity-robust intervals; ns = not statistically significant. Grade 3 has no prior test and is excluded; groups with fewer than 20 students are excluded. Full model output: Appendix Table B4.

Figure 5. District Virtual and Hybrid students scored about 22 to 24 points lower in Math after accounting for prior achievement.



Note: Grades 4 to 8 students with a prior year SC READY score; adjusts for prior score and grade; robust 95 percent intervals (black lines). Solid bars are statistically significant; open bars are not distinguishable from Face-to-Face. Grade 3 (no prior test) and groups with fewer than 20 students with a prior year score excluded.

Finding 7: Raw score gaps narrow in ELA by grade 8 but never close in Math

Raw SC READY results generally show Face-to-Face and Unknown students scoring above District Virtual and Hybrid students, although the size of the differences changes by grade and subject (Appendix Tables B2 and B3, Figures B1 and B2). The clearest contrast is between the two subjects. In ELA, the gap between Face-to-Face and District Virtual students shrinks across grades and is essentially gone by grade 8, when District Virtual students averaged 585.5 compared with 581.1 for Face-to-Face. In Math, the gap also narrows with grade but never closes: 82 points in grade 3 (463.0 versus 380.5) and still 29 points in grade 8 (552.8 versus 524.1). This mirrors the adjusted results in Finding 6, where the Math differences were roughly two to three times the ELA differences.

The same general pattern appears when students are compared separately by poverty status. At grade 8, for example, District Virtual and Face-to-Face students have very similar ELA scores within each poverty group, while sizeable Math differences remain (Table 5). Differences in poverty composition alone therefore do not account for the ELA and Math patterns. Poverty composition also varies much less across delivery types here than in high school: the share of students in poverty ranges from about 61 to 72 percent across the grades 3 to 8 delivery types (Appendix Table B5), compared with 58 to 87 percent in EOCEP (Finding 3).

Instructional delivery type is associated with a relatively small share of overall score variation in most grades. In grades 3 through 6, the share ranges from 0.12 to 0.31 percent in ELA and 0.65 to 0.85 percent in Math (Appendix Table B6). Grade 8 ELA is an exception at 2.0 percent, largely because of the unusually high-scoring Unknown group. As shown in Findings 5 and 6, much of that group's raw advantage reflects who is in the category and becomes very small once prior achievement is taken into account.

Table 5. Grade 8 mean scores by poverty status and instructional delivery type

Instruction type	ELA, not in poverty	ELA, in poverty	Math, not in poverty	Math, in poverty
Face-to-Face	604.8	569.4	580.7	538.7
Unknown	635.6	593.9	600.6	545.9
District Virtual	604.4	575.6	544.0	513.4
Hybrid	593.4	570.6	530.5	510.7

Grade 8 tested students with known poverty status; groups under 20 in either poverty cell omitted. Poverty-stratified results for all grades are shown in Appendix Figures B5 and B6.

5. Limitations and Data Quality

Selection. Students were not randomly assigned to instructional delivery types. The results in this report are associations, not causal effects. For SC READY, prior-year score is the main control: the model compares grade 4 to 8 outcomes at the same prior score and grade. That control cannot capture what happened between the two tests (a family move, an illness, a schedule change) or why a student ended up in a virtual, hybrid, or Face-to-Face course. Grade 3 is excluded because there is no prior-year SC READY score.

EOCEP is harder to adjust for because there is no prior-year test in the same subject. The best comparison available is within schools, while also accounting for grade, semester the test was taken, and poverty. That gets closer to comparing similar students, but it still leaves differences the data cannot measure. The model therefore shows what remains after those adjustments; it does not show that delivery type caused the gap.

One methodological note. Delivery type was assigned once per student per subject using course records. In an earlier version, some records with more than one delivery type could be counted in more than one group. Fixing that had little effect on the SC READY adjusted results, but the EOCEP adjusted differences became somewhat larger. A second check used a narrower set of EOCEP-eligible courses; participation and pass-rate results were similar. Appendix C provides the details.

Participation. Score and pass-rate results reflect students with a recorded score. SC READY participation is high, 92 to 97 percent for the major delivery groups, lower only in the small Other Virtual group. EOCEP is different: only 31.5 percent of VirtualSC student-subject enrollments have a

recorded score, and the records do not say why the rest are missing. VirtualSC's EOCEP results therefore describe only the subset with a recorded score.

Prior-year SC READY scores were available for 92 to 94 percent of students in grades 4 to 8, with somewhat lower coverage in the virtual groups. Adjusted SC READY results apply to students with an in-state prior testing history.

Small groups and school coverage. Distance Learning and Out-of-State Virtual include relatively few students in both assessments, so many results are suppressed or excluded from the models. Any group with fewer than 20 tested students is not reported. EOCEP models also require enough schools to support the estimate. Out-of-State Virtual did not meet that requirement in any subject, and Distance Learning met it only in Algebra 1. Results from these small groups are therefore limited and should not be generalized broadly.

One note when comparing counts across grades: the grade 8 enrollment file is smaller than the grade 6 and 7 files. That reflects the source data as received, not the analysis.

Population definition and data quality. The list of EOCEP-eligible courses grew from 18 to 23 codes this year; the additions are advanced course variants, so comparisons with prior years should be made carefully. The EOCEP file arrived already limited to eligible courses, which means EOCEP's share of statewide enrollment cannot be determined from these data.

Missing delivery information is the other major data-quality issue. About 20 percent of EOCEP enrollment records lack a reported delivery type, and about 11 percent of SC READY student-subject assignments are Unknown, as detailed in Finding 5. These records stay in the analysis but are not treated as a distinct instructional method.

Additional notes: duplicate test records were resolved by keeping the highest score, and records with invalid identifiers were removed. Poverty status was available for 98.3 percent of the EOCEP analysis population and 97.7 percent of the SC READY analysis population. Where a student's poverty records conflicted, the student was classified as in poverty if any record said so.

6. Implications and Recommendations

- Follow up with districts where instructional delivery type is frequently missing. Ten districts account for 86 percent of uncoded EOCEP enrollment records, with Greenville 01 alone at about 42 percent (Finding 5, Table 3). Improved course and delivery reporting could reduce the Unknown category, which covers about one-fifth of EOCEP enrollment records and about one-tenth of SC READY student-subject assignments.

- Investigate the low EOCEP participation rate for VirtualSC. Only 31.5 percent of VirtualSC student-subject enrollments have a recorded EOCEP score, and the available data do not show why the remaining records have no score (Finding 4). Distinguishing course withdrawal, exemption, absence, and other reasons would clarify what is behind the missing test results.

- Give particular attention to mathematics in future reviews of virtual and hybrid instruction. In SC READY, the largest adjusted differences appear in Math (Finding 6). In EOCEP, Algebra 1 shows the strongest overall relationship between instructional delivery type and performance (Findings 1 and 2).

- Compare like with like (e.g., comparing students taking courses for credit recovery with other course retakes) when judging delivery types. Poverty composition differs across instructional groups, and EOCEP participation is lower in several virtual and hybrid groups, especially VirtualSC (Findings 3 and 4). Raw comparisons mix those differences with differences across instructional delivery types. The adjusted analyses account for measured differences where possible, and sizable associations remain.

Appendices

Appendix A: EOCEP Tables and Charts

Table A1. Student-subject records, tested counts, and participation by instructional delivery type

Instruction type	Student-subject records	With a score	Percent tested
Face-to-Face	194,146	186,743	96.2
Unknown	47,681	44,242	92.8
District Virtual	8,841	7,341	83.0
Hybrid	3,985	3,479	87.3
VirtualSC	710	224	31.5
Distance Learning	200	120	60.0
Out-of-State Virtual	36	25	69.4

One record per student per subject; a student appears once for each subject taken.

Table A2. Mean scale scores by subject and instructional delivery type, among tested students (tested count in parentheses)

Instruction type	Algebra 1	English 2	Biology 1	U.S. History
Face-to-Face	72.1 (48,902)	78.9 (46,705)	68.4 (47,254)	69.6 (43,882)
Unknown	74.5 (10,266)	77.8 (11,707)	69.3 (10,581)	69.1 (11,688)
District Virtual	59.2 (1,911)	74.4 (1,808)	59.7 (1,647)	58.4 (1,975)
Hybrid	58.2 (880)	71.0 (873)	55.9 (776)	54.9 (950)
VirtualSC	53.6 (45)	59.8 (31)	56.3 (79)	50.0 (69)
Distance Learning	51.0 (57)	62.1 (27)	48.6 (21)	*
Out-of-State Virtual	*	*	*	*

** fewer than 20 tested students, suppressed. Pass rates: Table 2 in the main report.*

Table A3. Statistical tests of score differences by instructional delivery type

Subject	Welch F	p	Equal variances	Percent of variation associated with delivery type
Algebra 1	712.9	under .001	rejected	3.91
English 2	124.3	under .001	rejected	0.85
Biology 1	188.9	under .001	rejected	1.18
U.S. History	316.6	under .001	rejected	1.67

Welch's analysis of variance, used because group variances are unequal in every subject. Pairwise: Games-Howell finds 47 of 55 comparisons significant, Tukey 43; the two procedures agree on 51 of 55, with all four disagreements in small-group pairs, treated as not established.

Table A4. Adjusted differences in passing without the poverty term (percentage points versus Face-to-Face)

Subject	Instruction type	Tested	Adjusted difference	95% interval	Significant
Algebra 1	District Virtual	1,911	-31.2	-36.8 to -25.7	Yes
Algebra 1	Hybrid	880	-23.4	-31.9 to -14.8	Yes
Algebra 1	Distance Learning	57	-28.8	-39.8 to -17.8	Yes
Algebra 1	VirtualSC	45	-49.7	-65.4 to -34.0	Yes
Algebra 1	Unknown	10,266	-0.8	-10.3 to +8.7	No

English 2	District Virtual	1,808	-27.3	-34.0 to -20.6	Yes
English 2	Hybrid	873	-28.9	-42.2 to -15.6	Yes
English 2	VirtualSC	31	-62.2	-77.4 to -46.9	Yes
English 2	Unknown	11,707	+1.7	-9.1 to +12.5	No
Biology 1	District Virtual	1,647	-17.5	-29.7 to -5.3	Yes
Biology 1	Hybrid	776	-38.0	-44.4 to -31.7	Yes
Biology 1	VirtualSC	79	-19.8	-51.4 to +11.8	No
Biology 1	Unknown	10,581	+12.6	+0.5 to +24.8	Yes
U.S. History	District Virtual	1,975	-19.0	-29.0 to -9.1	Yes
U.S. History	Hybrid	950	-18.9	-30.6 to -7.1	Yes
U.S. History	VirtualSC	69	-35.9	-51.6 to -20.2	Yes
U.S. History	Unknown	11,688	+1.5	-11.2 to +14.2	No

Linear probability models; school, grade, and test administration window fixed effects; school clustered errors. Tested = students with a score in the group and subject. Groups with too few schools or tested students within a subject are excluded per the reliability standard (Table A5 note).

Table A5. Adjusted differences in passing with the poverty term (percentage points versus Face-to-Face; source of Table 2)

Subject	Model term	Tested	Adjusted difference	95% interval	Significant
Algebra 1	District Virtual	1,911	-32.1	-37.7 to -26.5	Yes
Algebra 1	Hybrid	880	-23.2	-31.9 to -14.5	Yes
Algebra 1	Distance Learning	57	-25.6	-37.0 to -14.1	Yes
Algebra 1	VirtualSC	45	-48.1	-63.6 to -32.5	Yes
Algebra 1	Unknown	10,266	-1.0	-10.4 to +8.4	No
Algebra 1	Pupil in poverty		-11.4	-12.7 to -10.2	Yes
English 2	District Virtual	1,808	-26.7	-33.5 to -19.9	Yes
English 2	Hybrid	873	-28.9	-41.9 to -16.0	Yes
English 2	VirtualSC	31	-59.2	-74.4 to -43.9	Yes
English 2	Unknown	11,707	+0.9	-9.8 to +11.6	No
English 2	Pupil in poverty		-13.3	-14.4 to -12.1	Yes
Biology 1	District Virtual	1,647	-18.9	-30.7 to -7.1	Yes
Biology 1	Hybrid	776	-35.3	-41.2 to -29.4	Yes
Biology 1	VirtualSC	79	-17.7	-47.2 to +11.7	No
Biology 1	Unknown	10,581	+11.3	-0.3 to +22.8	No
Biology 1	Pupil in poverty		-20.0	-21.5 to -18.5	Yes
U.S. History	District Virtual	1,975	-19.2	-28.9 to -9.6	Yes
U.S. History	Hybrid	950	-20.3	-32.1 to -8.4	Yes
U.S. History	VirtualSC	69	-30.6	-44.1 to -17.1	Yes
U.S. History	Unknown	11,688	+2.3	-8.8 to +13.4	No
U.S. History	Pupil in poverty		-21.2	-22.6 to -19.8	Yes

Same models as Table A4 with a student poverty indicator added. Reliability standard: at least 10 schools and 20 tested students per group within a subject; Out-of-State Virtual fails in every subject, Distance Learning in all but Algebra 1.

Table A6. Poverty composition by instructional delivery type among tested EOCEP records

Instruction type	Tested student-subject records	Percent pupils in poverty
Distance Learning	120	86.6
VirtualSC	224	83.0
Out-of-State Virtual	25	76.0

Hybrid	3,479	69.7
District Virtual	7,341	61.6
Unknown	44,242	61.5
Face-to-Face	186,743	57.9

Poverty percentages are calculated among records with known poverty status.

Table A7. Pass rates by poverty status within instructional delivery type, all subjects

Subject	Poverty status	Instruction type	Tested	Percent passing
Algebra 1	In poverty	Face-to-Face	28,513	45.5
Algebra 1	In poverty	Unknown	6,131	51.4
Algebra 1	In poverty	District Virtual	1,231	15.5
Algebra 1	In poverty	Hybrid	606	12.9
Algebra 1	In poverty	VirtualSC	41	2.4
Algebra 1	In poverty	Distance Learning	35	2.9
Algebra 1	In poverty	Out-of-State Virtual	*	*
Algebra 1	Not in poverty	Face-to-Face	18,942	72.8
Algebra 1	Not in poverty	Unknown	3,740	79.6
Algebra 1	Not in poverty	District Virtual	661	29.2
Algebra 1	Not in poverty	Hybrid	270	27.8
Algebra 1	Not in poverty	VirtualSC	*	*
Algebra 1	Not in poverty	Distance Learning	*	*
Algebra 1	Not in poverty	Out-of-State Virtual	*	*
English 2	In poverty	Face-to-Face	26,336	64.8
English 2	In poverty	Unknown	6,981	61.9
English 2	In poverty	District Virtual	1,112	56.1
English 2	In poverty	Hybrid	618	46.9
English 2	In poverty	VirtualSC	28	10.7
English 2	In poverty	Distance Learning	21	33.3
English 2	Not in poverty	Face-to-Face	19,350	86.2
English 2	Not in poverty	Unknown	4,404	85.1
English 2	Not in poverty	District Virtual	681	69.3
English 2	Not in poverty	Hybrid	255	58.8
English 2	Not in poverty	VirtualSC	*	*
English 2	Not in poverty	Distance Learning	*	*
Biology 1	In poverty	Face-to-Face	26,819	34.5
Biology 1	In poverty	Unknown	6,306	38.0
Biology 1	In poverty	District Virtual	1,001	22.0
Biology 1	In poverty	Hybrid	558	16.7
Biology 1	In poverty	VirtualSC	60	16.7
Biology 1	In poverty	Distance Learning	*	*
Biology 1	In poverty	Out-of-State Virtual	*	*
Biology 1	Not in poverty	Face-to-Face	19,456	65.9
Biology 1	Not in poverty	Unknown	3,959	68.2
Biology 1	Not in poverty	District Virtual	641	34.9
Biology 1	Not in poverty	Hybrid	218	26.1
Biology 1	Not in poverty	VirtualSC	*	*
Biology 1	Not in poverty	Distance Learning	*	*
Biology 1	Not in poverty	Out-of-State Virtual	*	*
U.S. History	In poverty	Face-to-Face	24,137	36.7
U.S. History	In poverty	Unknown	6,962	38.4
U.S. History	In poverty	District Virtual	1,153	21.1
U.S. History	In poverty	Hybrid	640	16.4
U.S. History	In poverty	VirtualSC	56	7.1

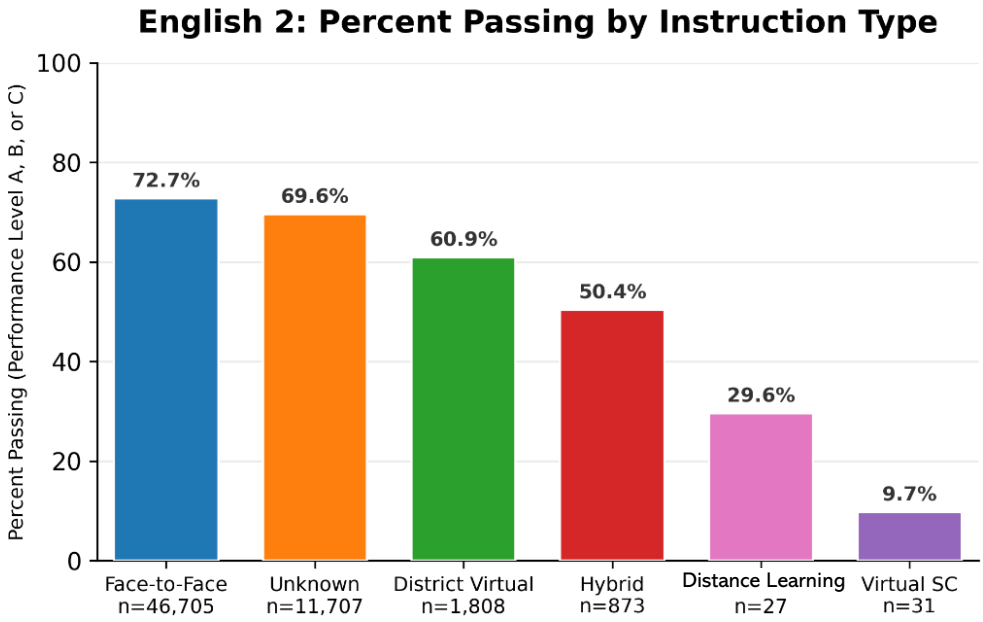
U.S. History	In poverty	Distance Learning	*	*
U.S. History	In poverty	Out-of-State Virtual	*	*
U.S. History	Not in poverty	Face-to-Face	19,186	66.6
U.S. History	Not in poverty	Unknown	4,410	67.6
U.S. History	Not in poverty	District Virtual	816	35.0
U.S. History	Not in poverty	Hybrid	309	27.8
U.S. History	Not in poverty	VirtualSC	*	*
U.S. History	Not in poverty	Distance Learning	*	*

** fewer than 20 tested students in the cell, suppressed. Source of Figure 3.*

(Appendix A continued on next page)

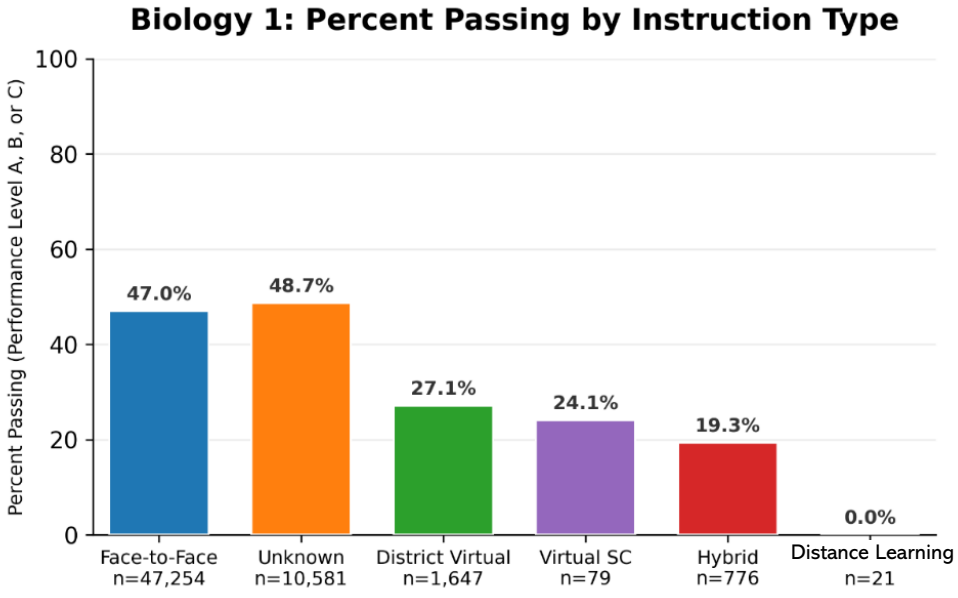
Appendix A figures

Figure A1: Percent passing by delivery type, English 2.



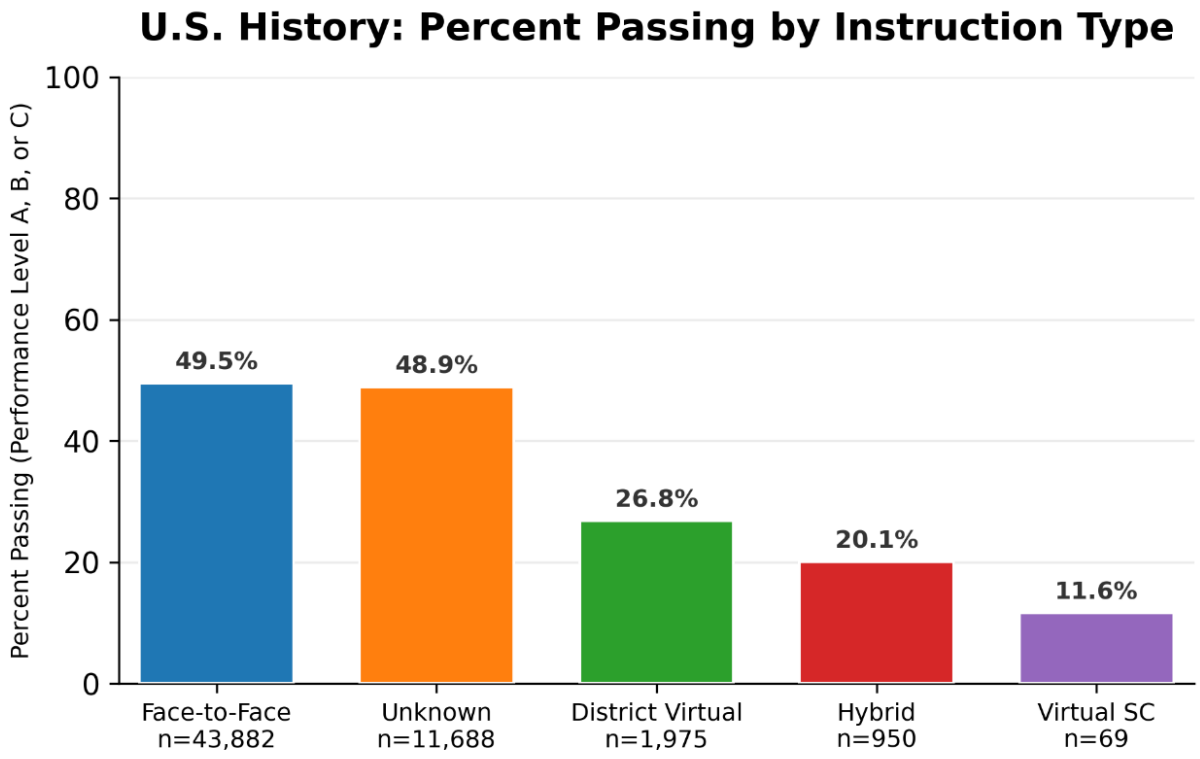
Note: Among tested students; n = tested students in the group. Formats with fewer than 20 tested students are not shown. Virtual SC results describe its tested minority (31.5 percent of enrollees).

Figure A2: Percent passing by delivery type, Biology 1.



Note: Among tested students; n = tested students in the group. Formats with fewer than 20 tested students are not shown. Virtual SC results describe its tested minority (31.5 percent of enrollees).

Figure A3: Percent passing by delivery type, U.S. History.



Note: Among tested students; n = tested students in the group. Formats with fewer than 20 tested students are not shown. Virtual SC results describe its tested minority (31.5 percent of enrollees).

Figure A4: Adjusted differences in passing versus Face-to-Face students in the same school, English 2 (companion to Figure 2).

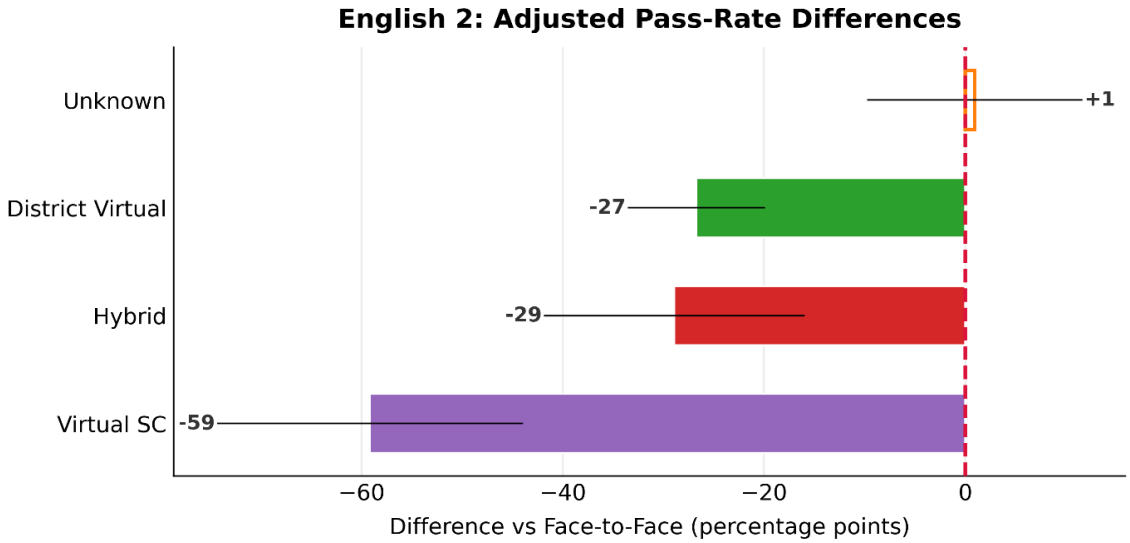


Figure A5: Adjusted differences in passing, Biology 1.

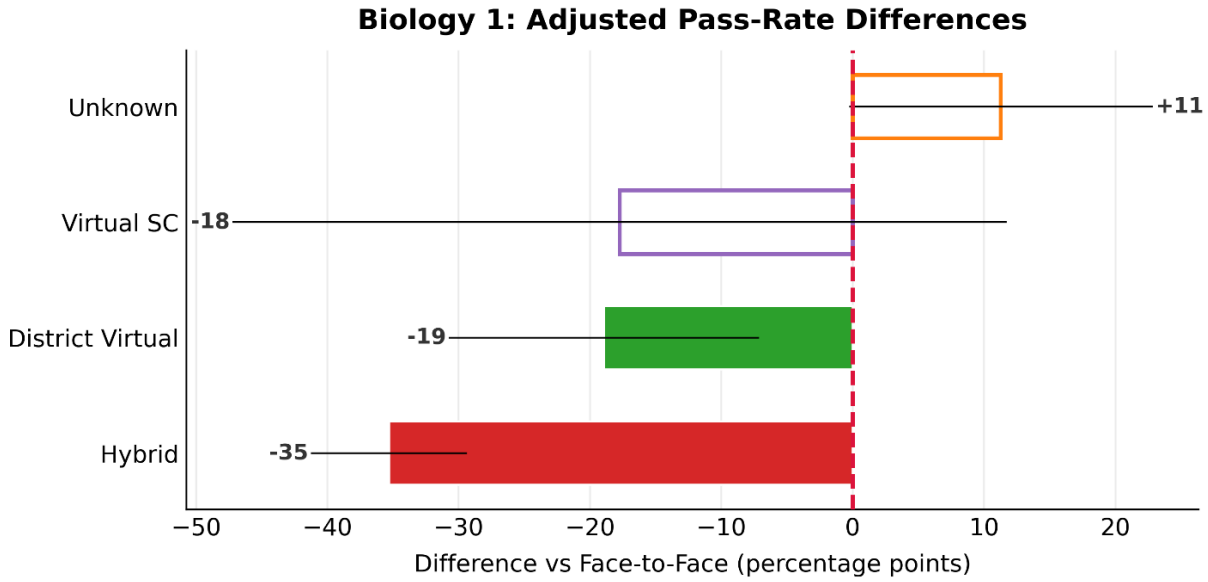


Figure A6: Adjusted differences in passing, U.S. History.

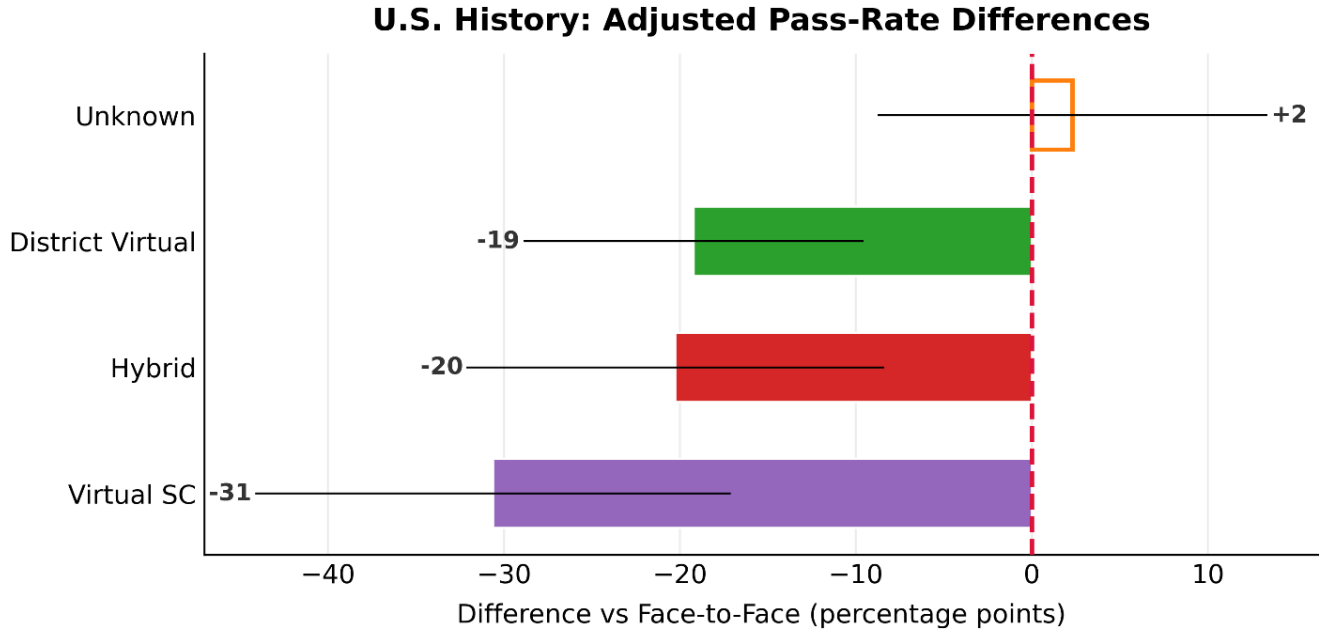
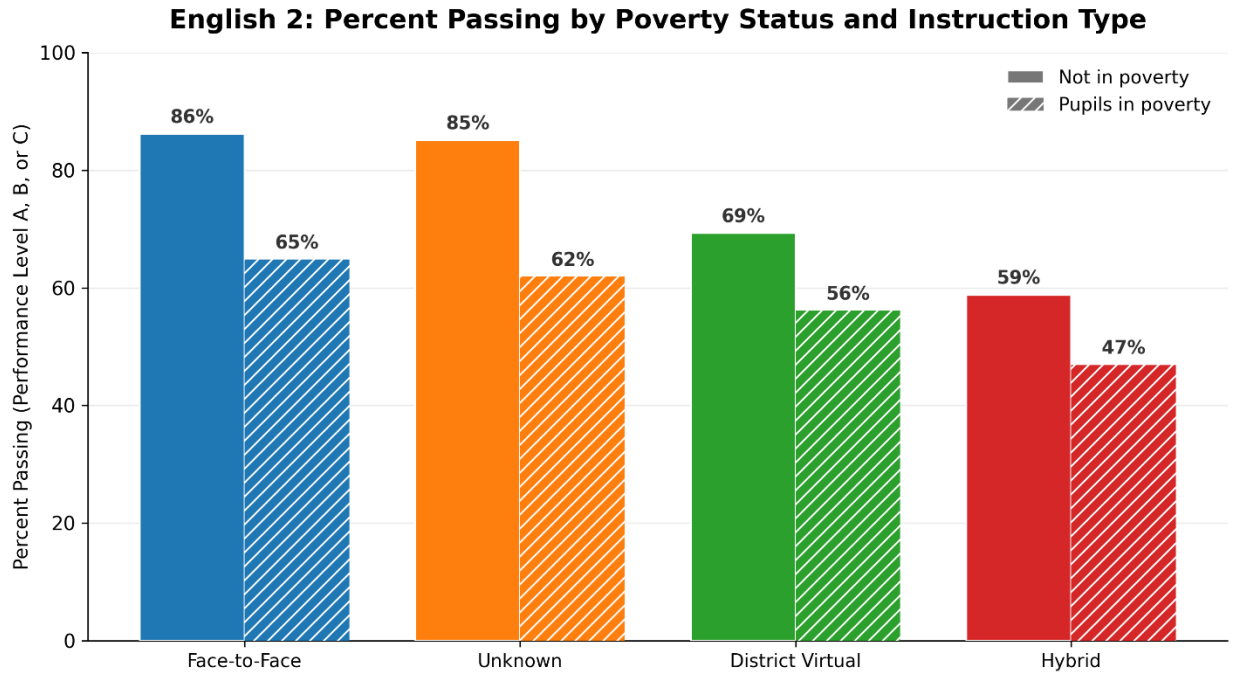
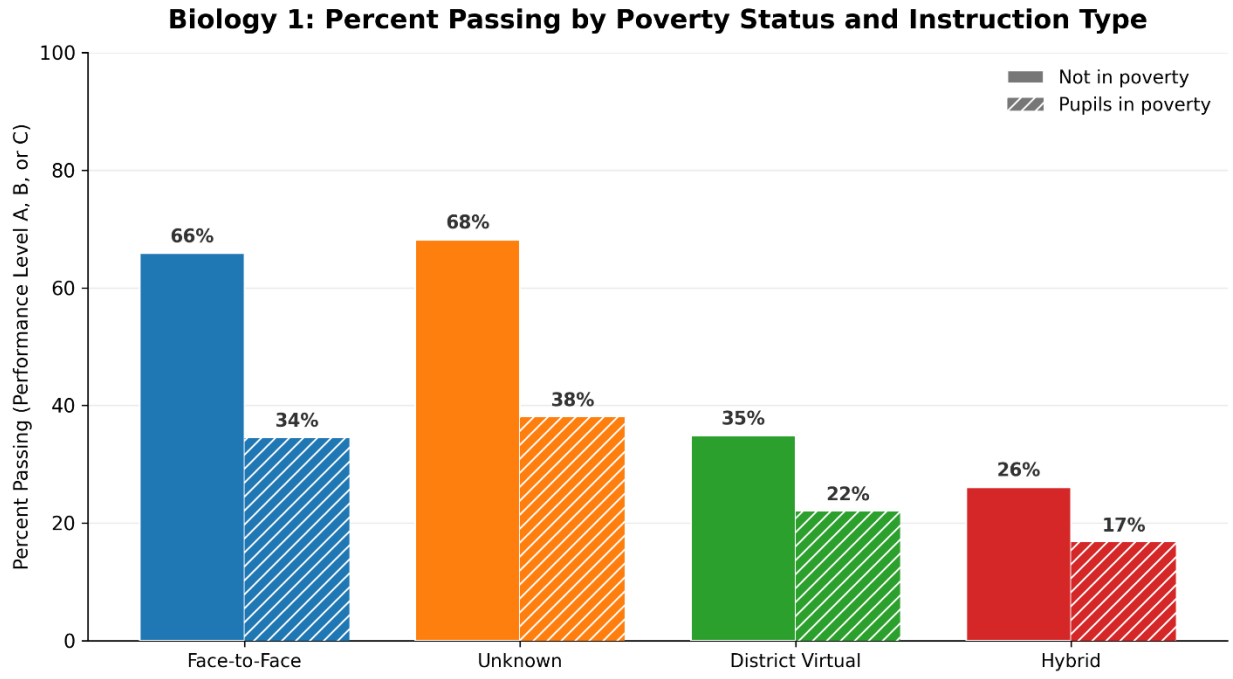


Figure A7: Pass rates by poverty status within delivery type, English 2 (companion to Figure 3).



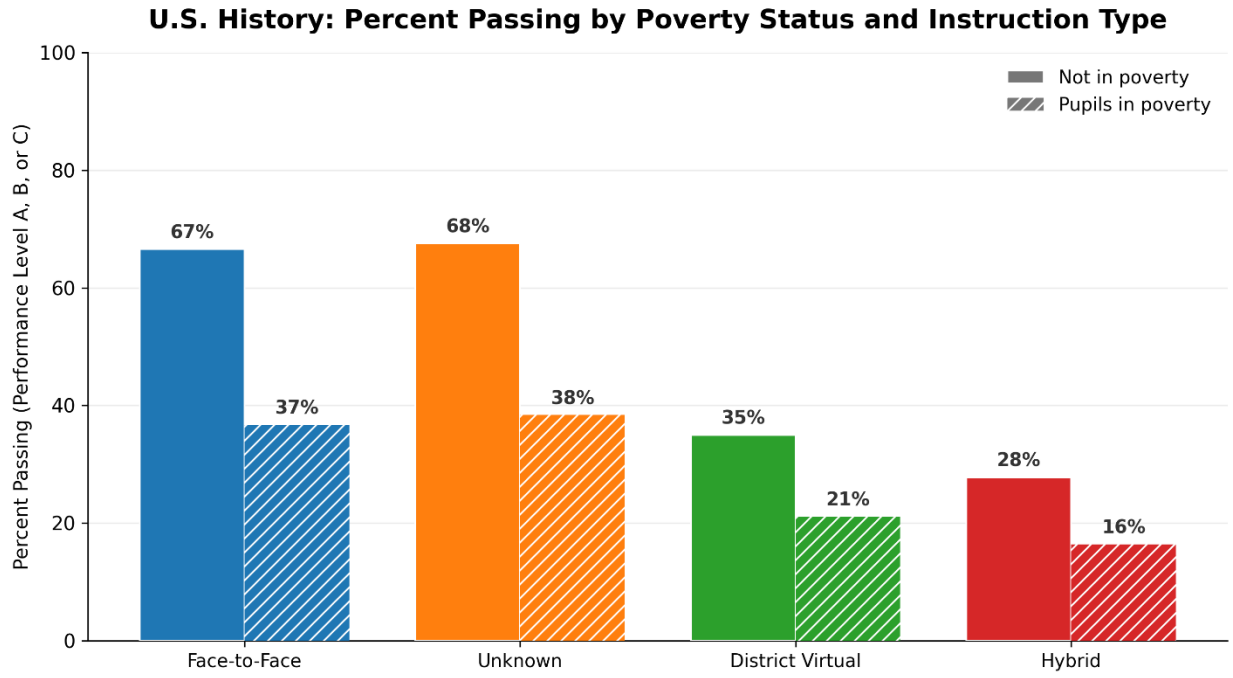
Note: Among tested students with known poverty status. Solid bars: students not in poverty. Hatched bars: pupils in poverty. Formats with fewer than 20 tested students in either group are not shown.

Figure A8: Pass rates by poverty status within delivery type, Biology 1.



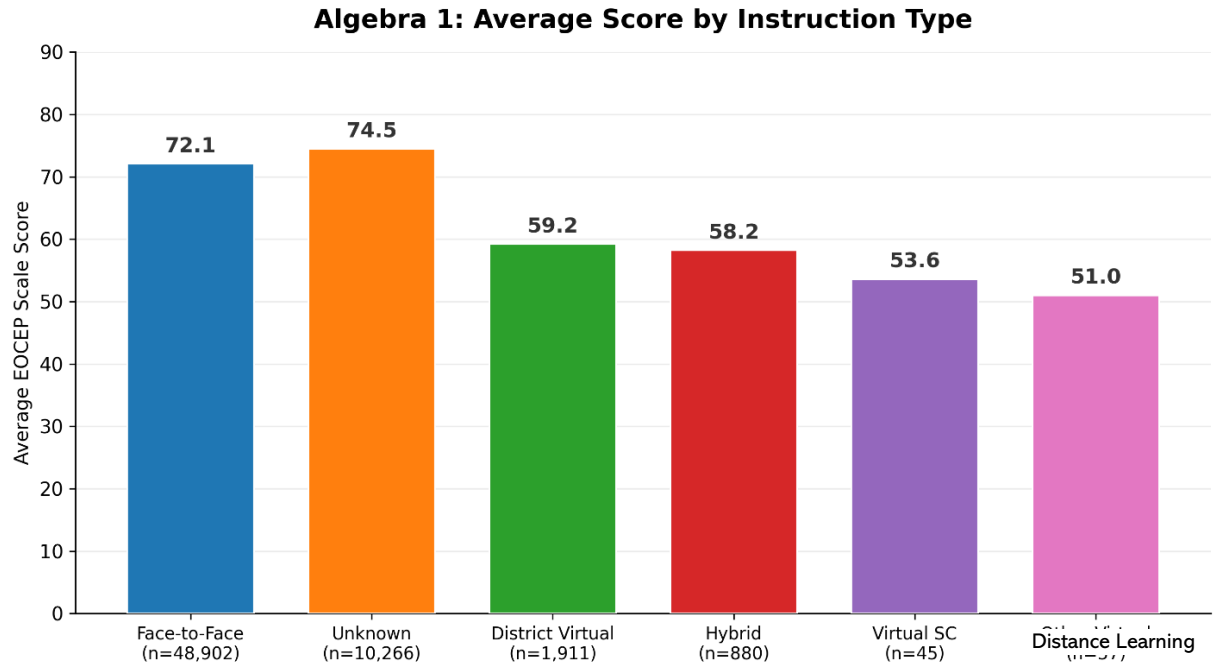
Note: Among tested students with known poverty status. Solid bars: students not in poverty. Hatched bars: pupils in poverty. Formats with fewer than 20 tested students in either group are not shown.

Figure A9: Pass rates by poverty status within delivery type, U.S. History.



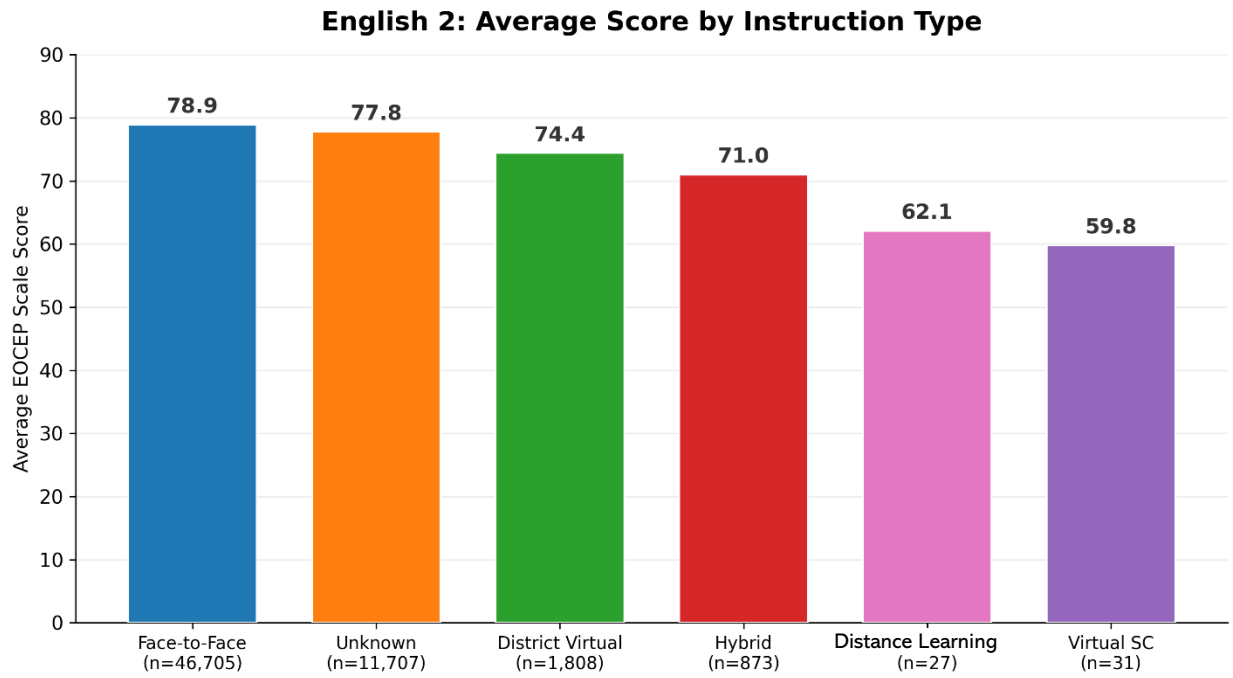
Note: Among tested students with known poverty status. Solid bars: students not in poverty. Hatched bars: pupils in poverty. Formats with fewer than 20 tested students in either group are not shown.

Figure A10: Average scale score by delivery type, Algebra 1 (source data: Table A2).



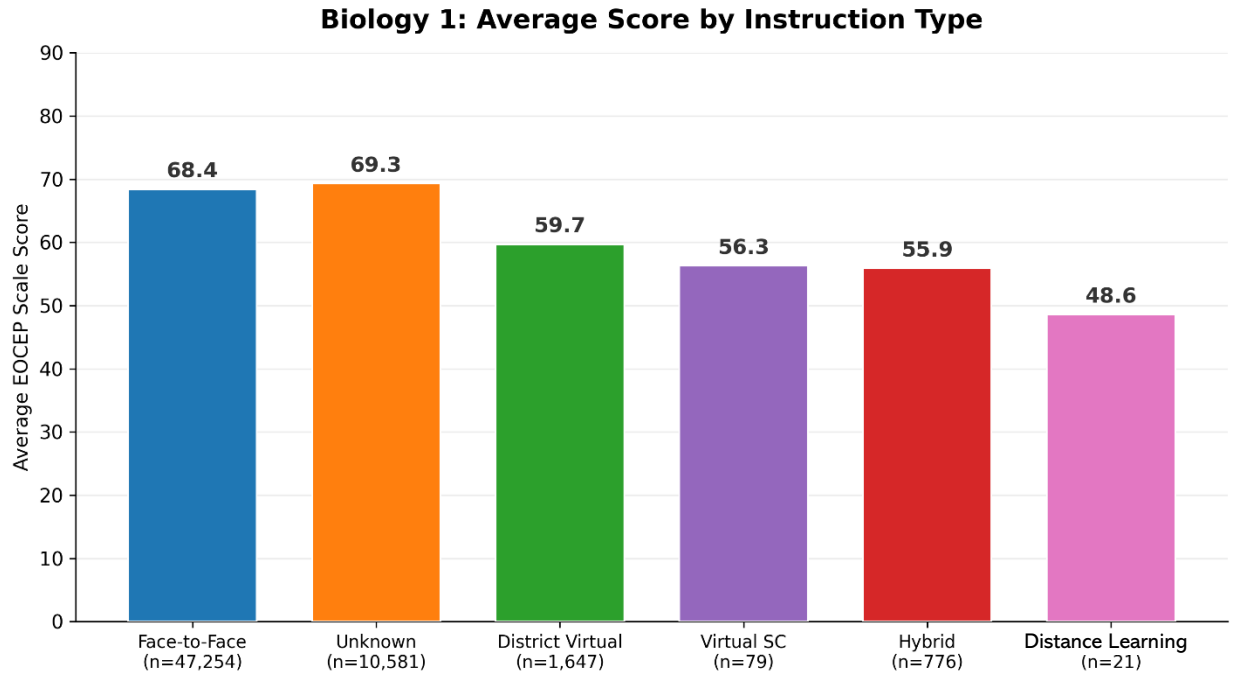
Note: Among tested students; n = tested students in the group. Formats with fewer than 20 tested students are not shown. Virtual SC results describe its tested minority (31.5 percent of enrollees).

Figure A11: Average scale score by delivery type, English 2.



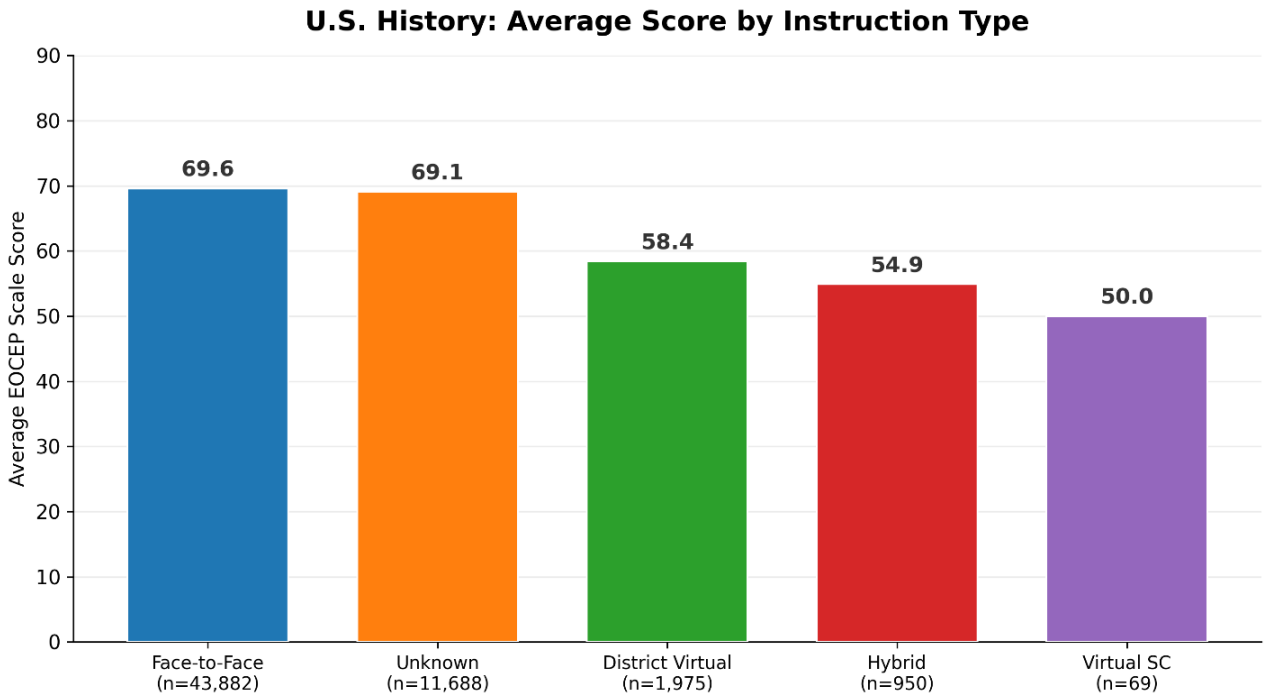
Note: Among tested students; n = tested students in the group. Formats with fewer than 20 tested students are not shown. Virtual SC results describe its tested minority (31.5 percent of enrollees).

Figure A12: Average scale score by delivery type, Biology 1.



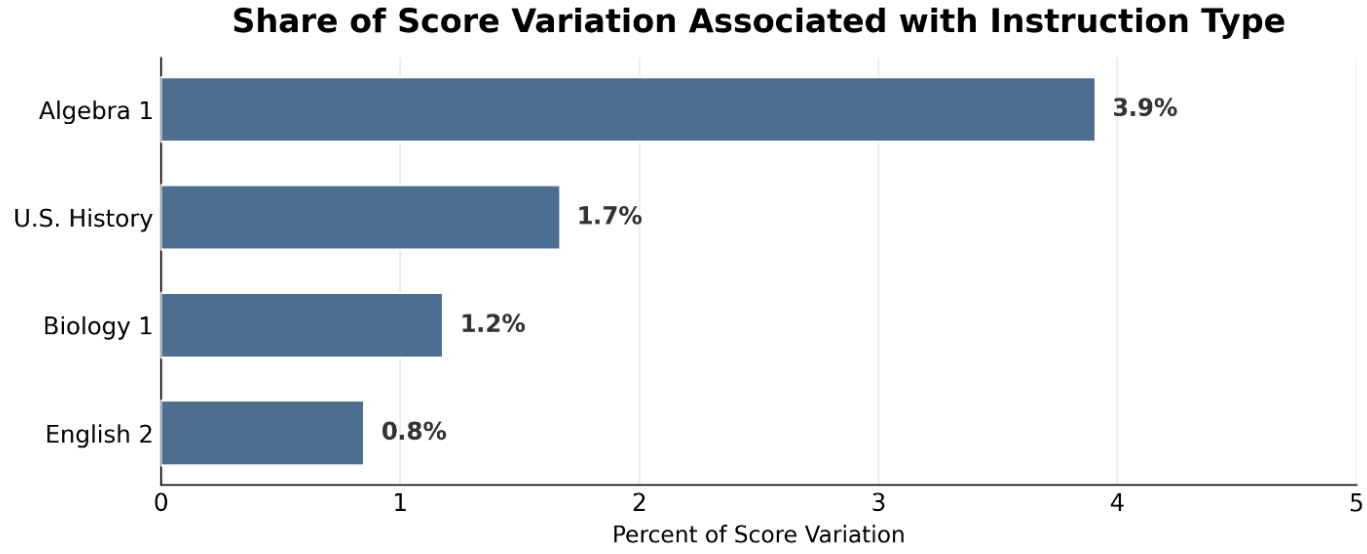
Note: Among tested students; n = tested students in the group. Formats with fewer than 20 tested students are not shown. Virtual SC results describe its tested minority (31.5 percent of enrollees).

Figure A13: Average scale score by delivery type, U.S. History.



Note: Among tested students; n = tested students in the group. Formats with fewer than 20 tested students are not shown. Virtual SC results describe its tested minority (31.5 percent of enrollees).

Figure A14: Share of score variation associated with delivery type by subject.



Note: Partial eta squared from Welch's ANOVA, among tested students. Association, not causation: groups are observational, not assigned. Even the largest share leaves over 96 percent of variation associated with other factors.

Appendix B: SC READY Tables and Charts

Table B1. SC READY participation by instructional delivery type

Instruction type	ELA students	Percent tested (ELA)	Math students	Percent tested (Math)
Face-to-Face	269,906	97.2	272,423	97.2
Unknown	36,163	97.0	33,763	97.3
District Virtual	5,297	92.5	5,401	92.8
Hybrid	2,161	93.2	2,039	92.8
VirtualSC	153	97.4	53	96.2
Distance Learning	46	73.9	47	66.0
Out-of-State Virtual	*	*	*	*

** fewer than 20 students, suppressed. Students counted within each subject's delivery assignment.*

Table B2. Mean ELA scale scores by grade and instructional delivery type (tested count in parentheses)

Instruction type	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Face-to-Face	481.3 (47,280)	535.6 (46,282)	553.7 (46,898)	570.2 (47,137)	588.6 (46,935)	581.1 (35,374)
Unknown	500.3 (1,820)	539.2 (1,863)	562.0 (1,704)	573.3 (10,110)	591.2 (10,032)	609.2 (10,634)
District Virtual	444.2 (523)	487.3 (562)	525.2 (675)	555.0 (993)	571.4 (1,244)	585.5 (1,300)
Hybrid	447.4 (220)	486.3 (235)	524.4 (223)	538.2 (413)	563.1 (532)	578.0 (538)
VirtualSC	508.3 (20)	*	*	*	588.7 (90)	562.1 (25)
Distance Learning	*	*	*	*	*	524.3 (33)
Out-of-State Virtual	*	*	*	*	*	*

** fewer than 20 tested students, suppressed.*

Table B3. Mean Math scale scores by grade and instructional delivery type (tested count in parentheses)

Instruction type	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
Face-to-Face	463.0 (47,223)	499.8 (46,378)	540.6 (46,807)	530.7 (47,060)	550.4 (47,535)	552.8 (37,420)
Unknown	475.8 (1,886)	502.8 (1,741)	549.7 (1,789)	533.0 (10,209)	552.9 (9,622)	565.0 (8,516)
District Virtual	380.5 (529)	418.0 (585)	466.2 (677)	471.3 (998)	504.7 (1,246)	524.1 (1,366)
Hybrid	384.2 (225)	417.1 (238)	465.8 (227)	474.3 (384)	505.6 (402)	517.4 (563)
VirtualSC	*	*	*	*	525.7 (28)	*
Distance Learning	*	*	*	*	*	452.3 (33)
Out-of-State Virtual	*	*	*	*	*	*

** fewer than 20 tested students, suppressed.*

Table B4. Prior-achievement-adjusted differences, full model output (scale points versus Face-to-Face)

Subject	Model	Instruction type	Adjusted difference (points)	95% interval	Significant
ELA	ANCOVA	District Virtual	-10.8	-12.2 to -9.3	Yes
ELA	ANCOVA	Hybrid	-8.0	-10.3 to -5.6	Yes
ELA	ANCOVA	Distance Learning	+6.2	-16.6 to +29.0	No
ELA	ANCOVA	Unknown	+0.9	+0.3 to +1.5	Yes
ELA	ANCOVA	VirtualSC	-1.7	-10.2 to +6.8	No
ELA	ANCOVA + poverty	District Virtual	-10.5	-11.9 to -9.0	Yes
ELA	ANCOVA + poverty	Hybrid	-7.3	-9.7 to -4.9	Yes
ELA	ANCOVA + poverty	Distance Learning	+6.2	-16.9 to +29.3	No
ELA	ANCOVA + poverty	Unknown	+1.0	+0.4 to +1.6	Yes
ELA	ANCOVA + poverty	VirtualSC	-1.8	-10.3 to +6.7	No
Math	ANCOVA	District Virtual	-23.8	-25.4 to -22.2	Yes
Math	ANCOVA	Hybrid	-22.5	-24.9 to -20.0	Yes
Math	ANCOVA	Distance Learning	-28.5	-43.4 to -13.7	Yes
Math	ANCOVA	Unknown	-2.1	-2.8 to -1.4	Yes
Math	ANCOVA	VirtualSC	-0.4	-14.1 to +13.4	No
Math	ANCOVA + poverty	District Virtual	-24.0	-25.6 to -22.4	Yes
Math	ANCOVA + poverty	Hybrid	-22.4	-24.9 to -20.0	Yes
Math	ANCOVA + poverty	Distance Learning	-28.4	-43.2 to -13.6	Yes
Math	ANCOVA + poverty	Unknown	-1.9	-2.6 to -1.3	Yes
Math	ANCOVA + poverty	VirtualSC	-0.5	-15.0 to +14.0	No

Grades 4 to 8 with a prior-year score (240,601 ELA; 240,834 Math); the first model adjusts for prior score and grade, the second adds student poverty; robust intervals; groups with fewer than 20 students with a prior-year score excluded (Out-of-State Virtual had 1). Source of Table 4.

Table B5. Poverty composition by instructional delivery type, SC READY analysis population

Instruction type	ELA student assignments	ELA percent in poverty	Math student assignments	Math percent in poverty
Hybrid	2,161	71.9	2,039	69.6
Distance Learning	46	70.5	47	71.1
District Virtual	5,297	67.3	5,401	67.2
VirtualSC	153	65.3	53	60.8
Face-to-Face	269,906	62.8	272,423	62.7
Unknown	36,163	62.5	33,763	62.8

Poverty percentages are calculated among students with known poverty status.

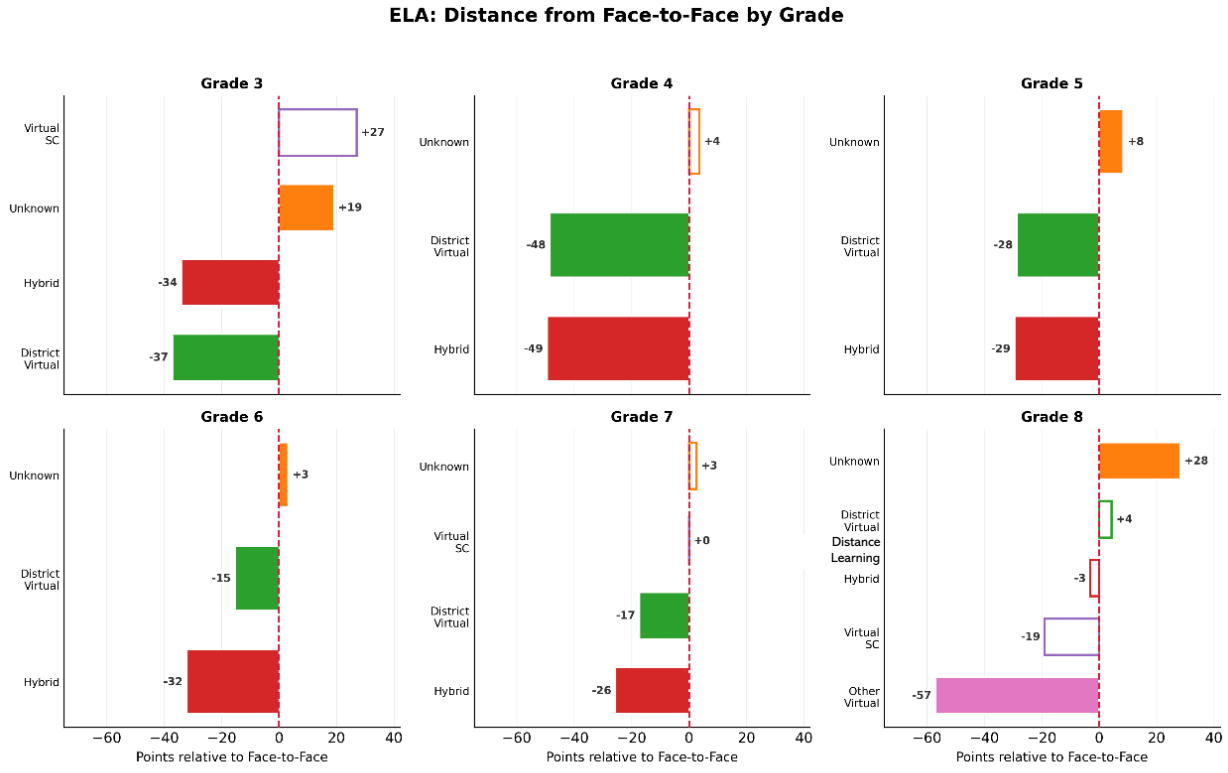
Table B6. Share of score variation associated with instructional delivery type, by grade and subject

Grade	Subject	Percent of variation
3	ELA	0.29
4	ELA	0.31
5	ELA	0.18
6	ELA	0.12
7	ELA	0.17
8	ELA	2.01
3	Math	0.75
4	Math	0.80
5	Math	0.85
6	Math	0.65
7	Math	0.52
8	Math	1.01

Welch's analysis of variance. All overall Welch tests were significant at p < .001. The grade 8 ELA value reflects the Unknown group (Finding 7).

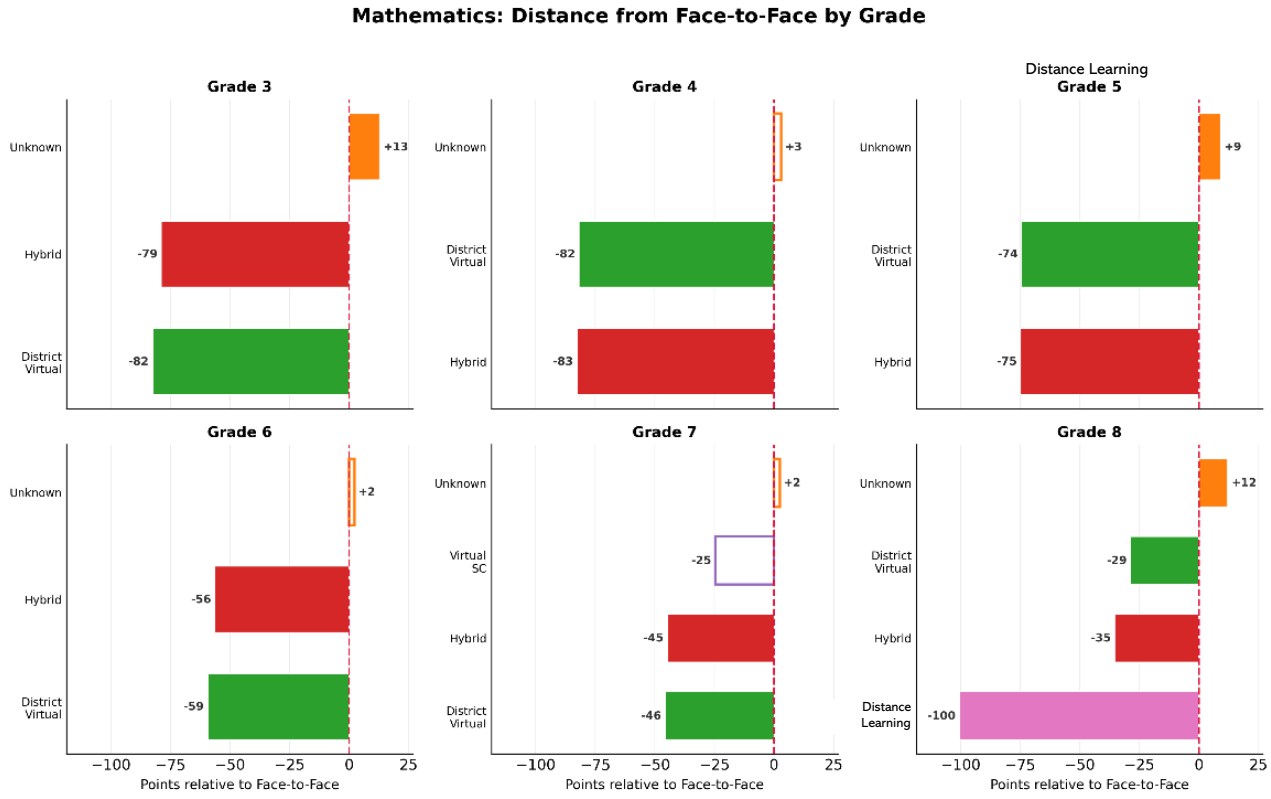
Appendix B figures

Figure B1. ELA score differences versus Face-to-Face by grade.



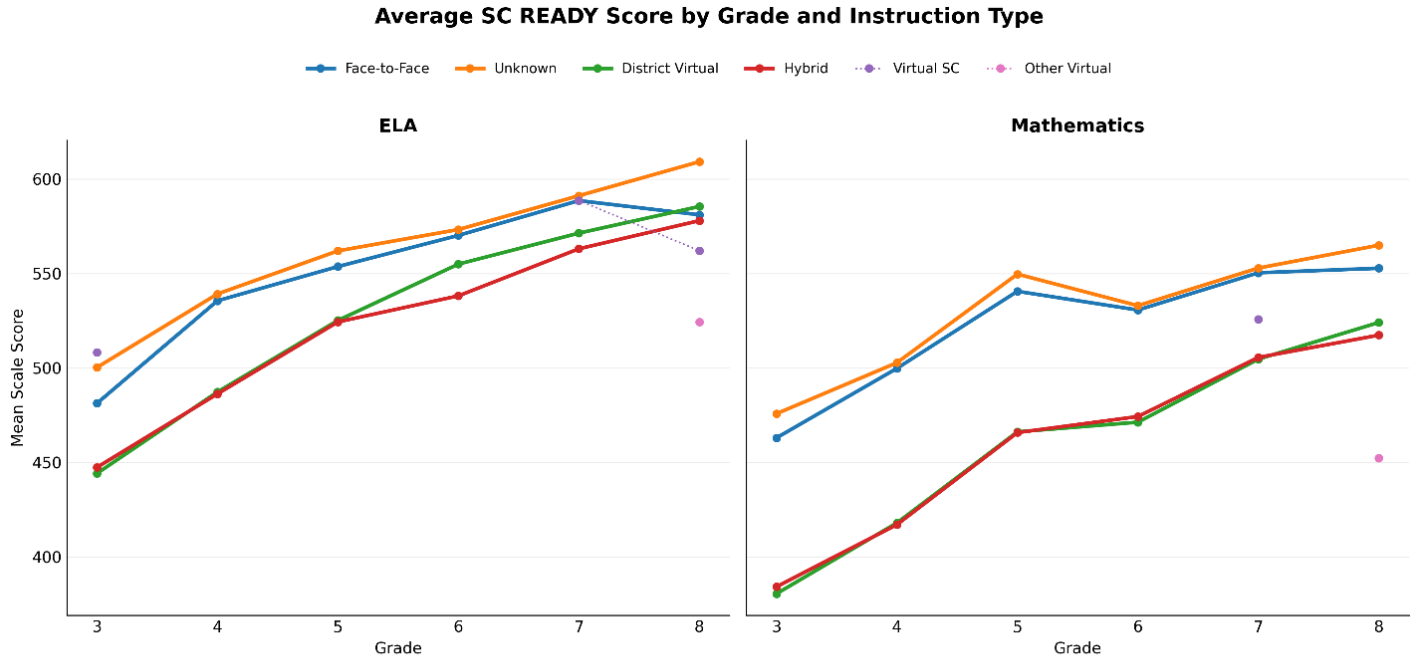
Note: Among tested students; formats with fewer than 20 tested students in a grade are not shown. Solid bars differ significantly from Face-to-Face (Games-Howell); open bars are not statistically distinguishable.

Figure B2. Math score differences versus Face-to-Face by grade.



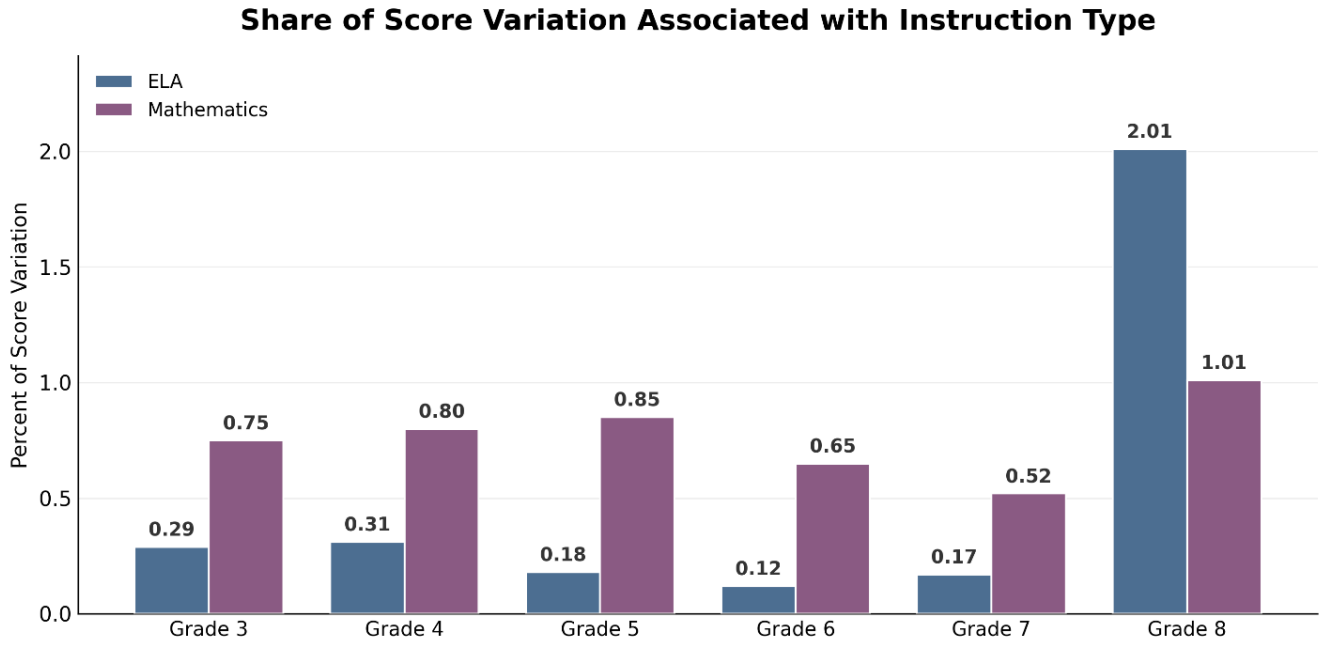
Note: Among tested students; formats with fewer than 20 tested students in a grade are not shown. Solid bars differ significantly from Face-to-Face (Games-Howell); open bars are not statistically distinguishable.

Figure B3. Mean SC READY scores by grade and instructional delivery type.



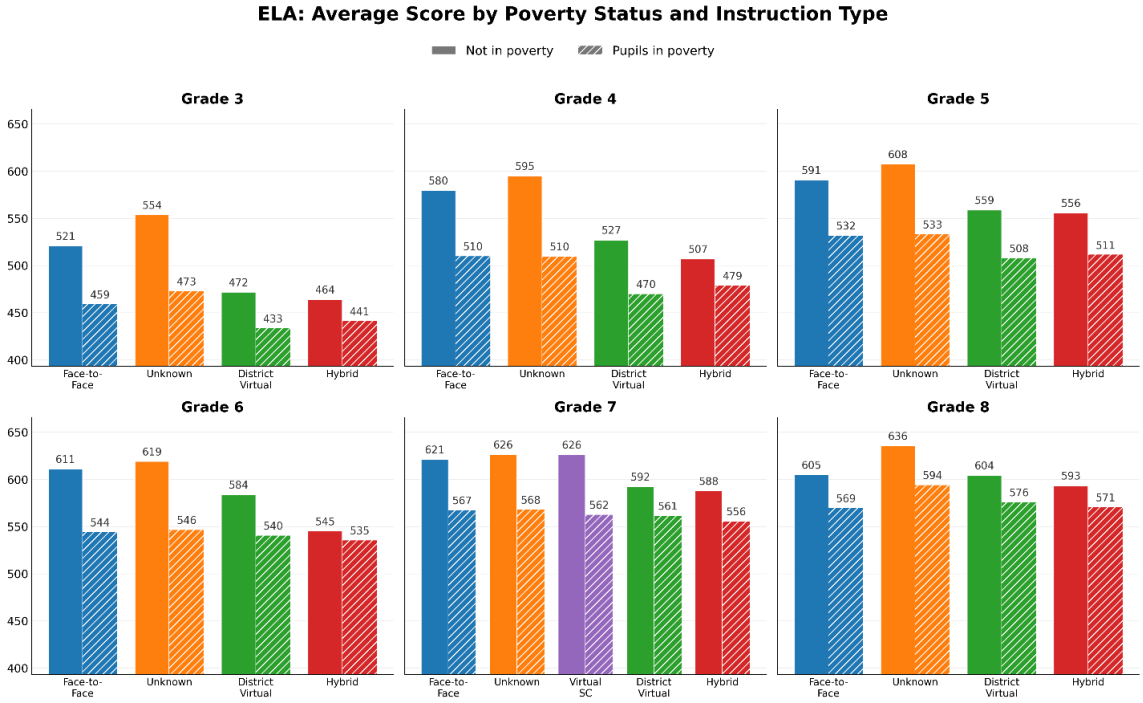
Note: Among tested students. A line is broken in grades where the format has fewer than 20 tested students. Thin dotted lines: small formats.

Figure B4. Share of score variation associated with instructional delivery type, by grade and subject.



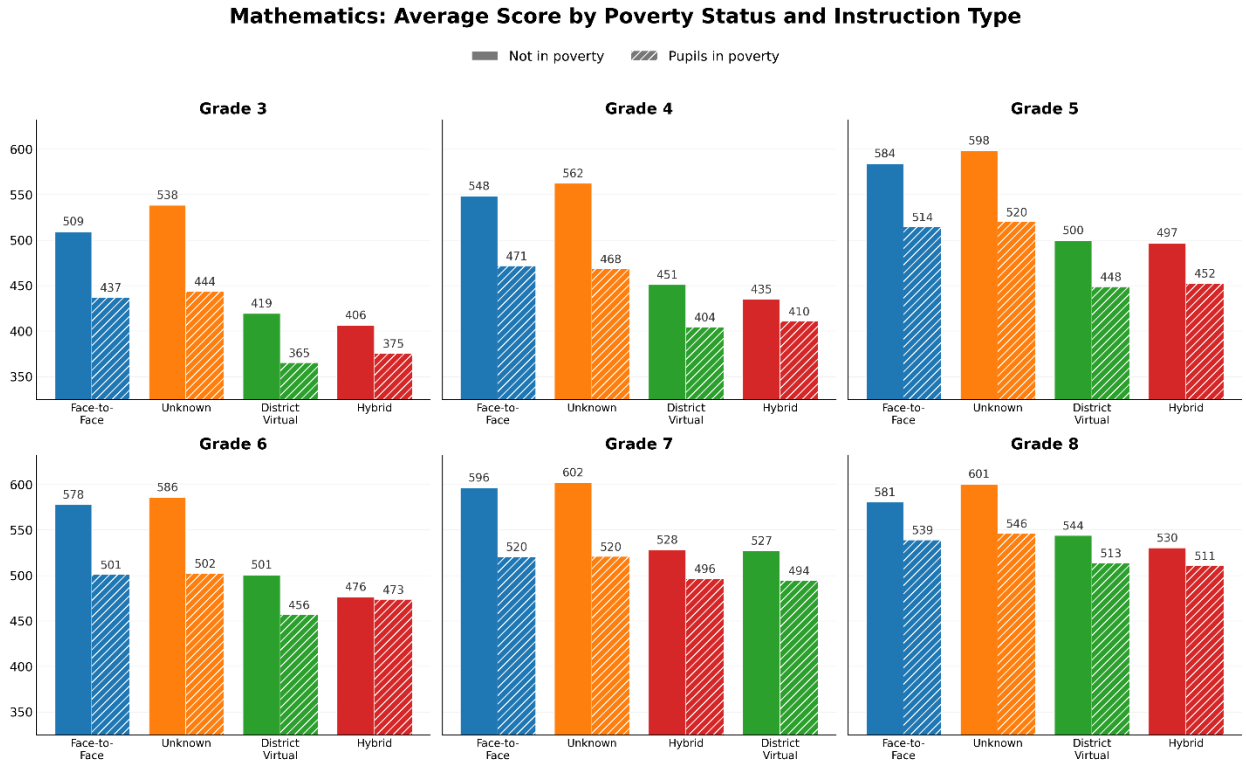
Note: Partial eta squared from Welch's ANOVA, among tested students. Association, not causation: groups are observational, not assigned. The grade 8 ELA bar reflects the Unknown group, not delivery type (see report text).

Figure B5. ELA scores by poverty status and instructional delivery type, by grade.



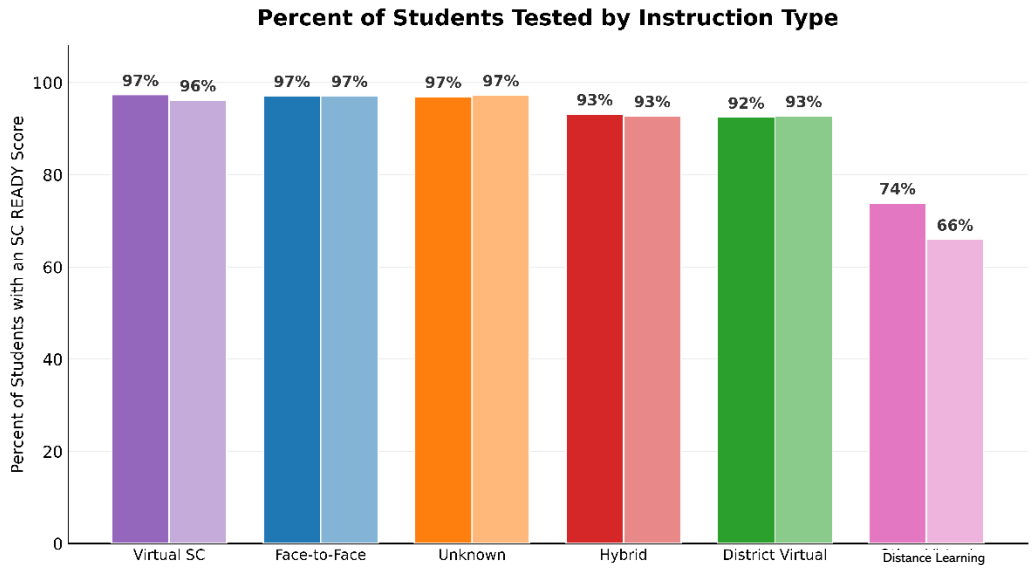
Note: Among tested students with known poverty status. Solid: not in poverty. Hatched: pupils in poverty. Types with fewer than 20 tested students in either group are not shown. All panels share one score scale; scores remain grade-specific tests.

Figure B6. Math scores by poverty status and instructional delivery type, by grade.



Note: Among tested students with known poverty status. Solid: not in poverty. Hatched: pupils in poverty. Types with fewer than 20 tested students in either group are not shown. All panels share one score scale; scores remain grade-specific tests.

Figure B7. SC READY test participation by instructional delivery type.



Note: Of students whose subject was delivered by each format, the share with a score. Solid: ELA. Lighter: Math. Formats under 20 students not shown.

Appendix C: Data Preparation, Methods, and Sensitivity Checks

Units of analysis. SC READY: one record per student per subject (313,727 students, grades 3 to 8). EOCEP: one record per student per subject (255,599 records for 183,612 students from 301,744 eligible enrollments, grades 7 to 12; 242,174 records carry a score). Each student's coursework is classified into one delivery type per subject: among coded eligible courses, the type with the most instructional days; ties resolve to the non-Face-to-Face type; if no coded subject course is available, the assignment is Unknown. In SC READY, Unknown also includes students for whom no course for that subject is found in the enrollment files.

Assignment correction. An earlier specification allowed 6,800 EOCEP student-subject records, 2.7 percent, to appear in more than one delivery group with the same score. After the unit was corrected, headline pass rates moved by one to three points and VirtualSC participation moved from 35.9 to 31.5 percent. The earlier EOCEP models also omitted the documented test administration window control. Correcting the unit and adding that control produced somewhat larger adjusted EOCEP differences, including Algebra 1 District Virtual moving from about minus 25 to minus 32 percentage points. The SC READY correction changed the adjusted results very little.

Eligibility sensitivity. Restricting EOCEP eligibility to a narrow core-course list produced substantively similar participation and pass rates. The narrower definition retained 93.6 percent of eligible EOCEP enrollment rows; VirtualSC participation was 32.6 percent under the restriction.

Models. EOCEP: linear probability models for passing and score models in standard deviation units; school, grade, and test administration window fixed effects; standard errors clustered by school; estimates reported only for groups with at least 10 schools and 20 tested students within a subject. SC READY: analysis of covariance on the SY 2024-25 score with prior-year score and grade as covariates, with and without a student poverty indicator; heteroskedasticity-robust intervals; grade 3 excluded (no prior test).

Data quality rules. Duplicate EOCEP tests (131 students) resolved by keeping the highest score; 537 EOCEP tester records and 59 prior-year records with invalid identifiers removed. Poverty status from 2025 Report Card files covered 98.3 percent of the EOCEP analysis population and 97.7 percent of the SC READY analysis population; students with conflicting records were classified as pupils in poverty if any record said so. Results for any group with fewer than 20 tested students are suppressed throughout.

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