A large teal circular graphic on the right side of the page. Inside the circle, there is a background image of a classroom. A woman is visible on the left, looking towards the right. In the center, there is a computer monitor displaying a whiteboard with some text and diagrams. On the right, a person is partially visible, looking at the monitor. The overall scene is dimly lit, with a teal tint.

# the impact of COVID-19 school closures on student learning

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## Executive summary

We examine the impact of schools transitioning to at-home learning in spring 2019 by comparing rates of growth among independent school students who took ERB's CTP tests in fall 2018, 2019 and 2020. For those students, learning growth in Math, Reading Comprehension, and Writing Concepts and Skills was 30% higher in 2018–2019 than in 2019–2020. There was also a 50% slowing of growth in Verbal and Quantitative Reasoning, showing that loss of classroom interaction affected the ability to use knowledge to solve problems more than the ability to acquire knowledge in the first place.

The impacts of distance learning also disproportionately affected students with lower levels of academic achievement, in particular boys. High performing girls, as a group, actually increased learning achievement at a faster rate during the year that included the COVID-disrupted spring of 2020.



The closing of school campuses due to the COVID-19 pandemic has led to deep concern about the resulting impacts on student learning. Those fears have been confirmed with data from national testing programs showing that the pace of student learning has indeed regressed, with students across the country - on average - ranging from one to five months behind where they were expected to be for the grade they entered in September 2020. Even more concerning, teachers have reported not being able to maintain contact with some students who have little or no access to computers and the internet.

These national results do not necessarily reflect the experience of students in private and independent schools, who benefit from smaller class sizes and more extensive support from teachers and learning specialists. To understand the impact of COVID-19 school closures on independent school students, the best source of data is ERB's standardized CTP tests of student learning. These assessments, administered to students in grades 1 through 9, are scored on a vertical scale that allows measurement of student growth from year to year. The data are organized in a way that enables us (as well as teachers and administrators) to track individual students over time rather than simply examining aggregate changes in the population of test takers.

This study is based on a sample of students who took CTP tests three times over the 24-month period from fall 2018 to fall 2020. By following the same students before and after the COVID-related disruptions of spring 2020, we are able to determine the impact of the abrupt shift to distance learning on students' academic growth.



*mastery, rather than surface understanding of the facts, grows more readily through classroom contact with teachers than through online or hybrid learning programs*

## Findings

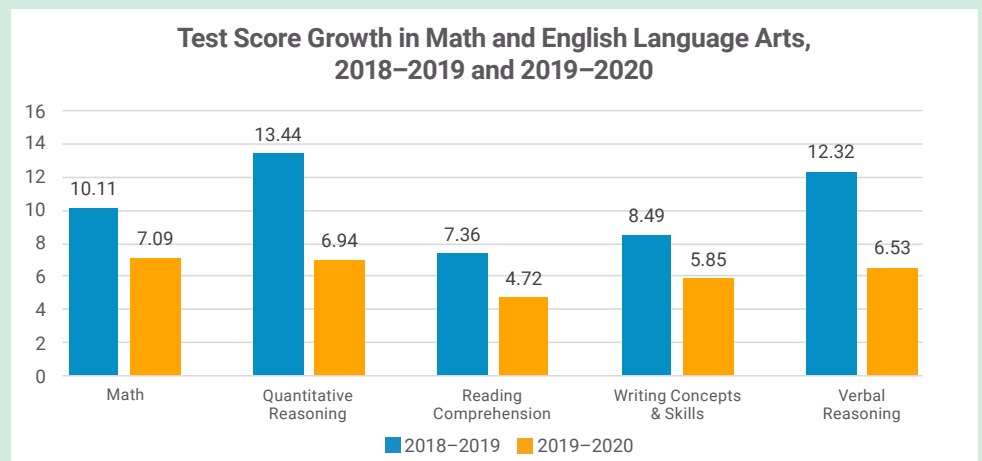
Nearly 2 million subject-specific CTP tests are typically taken each year by over 250,000 students drawn from over 1,000 schools, making any analysis of learning growth trends highly reliable. During fall 2020, however, fewer students took CTP tests than usual. Those who did so often took the tests at home, delivered online with their teachers serving as remote proctors. To ensure comparability, we examined score trends from 2018 and 2019 for this much smaller sample and found that they are representative of the larger universe of CTP test takers.

Figure 1 below shows the percentage change in student scores from fall 2018 to fall 2019 and then from fall 2019 to fall 2020. Data from grades 2 through 7 are combined in this graph, though inspection of the results for each grade shows a great deal of consistency.

COVID-related disruptions did reduce the rate of student learning during the spring and fall of 2020. Student growth from 2019 to 2020 in Mathematics, Reading Comprehension and Writing Skills and Concepts was only about 70% of the amount of growth in those same students from 2018 to 2019. It would be an exaggeration to call this “COVID Learning Loss,” but it certainly represents a slowing of growth. To that end, it is worth noting that a 30% loss of learning growth momentum is less dire than results reported based on national studies, such as the study published by McKinsey and Co.

## Figure 1

Percentage change in student scores.



Visibly evident in Figure 1, slowing of learning growth has been greater in Quantitative Reasoning and Verbal Reasoning than in other subject tests, with roughly half the amount of growth shown by the same students from fall 2018 to fall 2019.

Reasoning skills are built over time, not just by learning new material, but also by acquiring deep understanding that enables students to connect new material to what they already know and make inferences about problems they have not yet encountered. That kind of deep engagement with the material—mastery rather than surface understanding of the facts—appears to grow more readily through classroom contact with teachers than through online or hybrid learning programs.

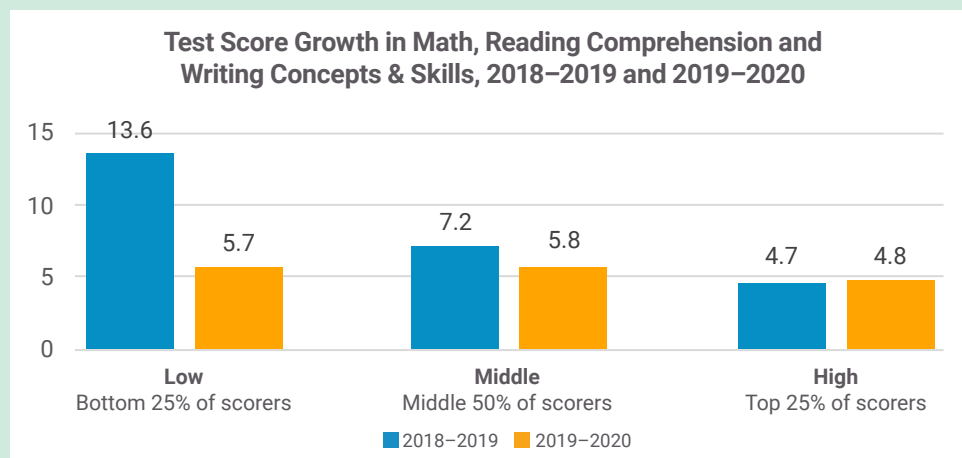


These findings raise the question as to whether the impact of virtual classrooms has been greater on some groups of students than others. To address this question, we examined the magnitude of learning loss among the students with the strongest and weakest test scores by dividing our population into the bottom 25% in test performance (“Low”), the middle 50% (“Middle”) and the top 25% (“High”) based on their scores in 2017–2018.

Between spring 2018 and fall 2019, students in the Low group showed the greatest degree of test score gain (13.6%), followed by the Middle group (7.2%) and the High group (4.2%). This is the usual pattern of growth from one year to the next, reflecting the fact that learning growth is never linear. Some students in the low performing group one year are ready to accelerate their growth, aided of course by the fact that teachers and learning specialists are paying special attention to their needs. Students in the Low group also have more opportunity for growth since there is more to be learned at their grade level.<sup>1</sup> See Figure 2, below.

## Figure 2

Percentage change in student scores by performance bucket.



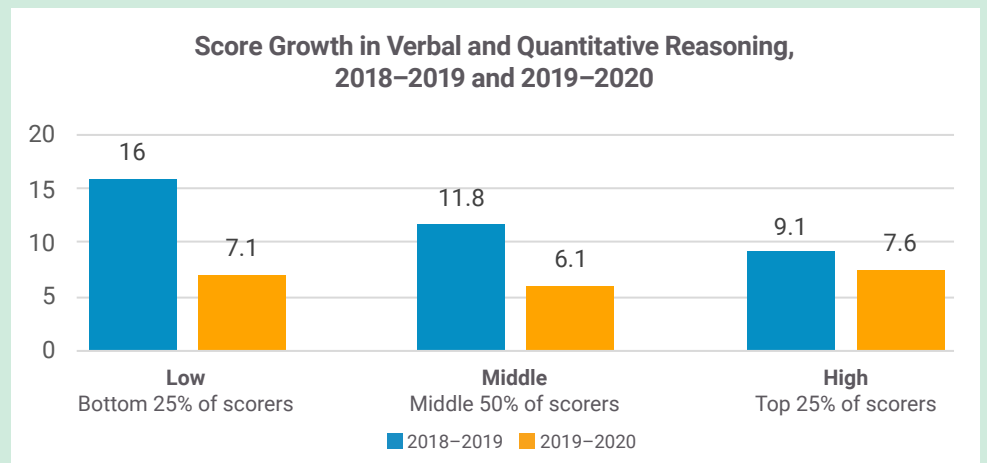
In the pandemic-disrupted spring and fall of 2020, however, this typical pattern of growth changed significantly. The amount of test score growth over that period was almost indistinguishable between the three groups, ranging from 5.7% in the lowest group to 4.8% in the highest group. While the consistency in learning growth across student performance levels may at first seem gratifying, it is important to note that the lowest performing student group was actually the most disadvantaged compared to the growth they would have experienced in the classroom. The virtual and hybrid learning models that schools were forced to adopt have thus had the greatest negative impact on the students who were already in the lowest achievement group.

<sup>1</sup> The pattern is related to what statisticians call “regression to the mean” – a tendency of those who are low in one measurement to be higher in the subsequent measurement, while those who are highest in the first measurement will tend to be less high in the next. We find this consistently across each of the three measures of Math, Reading Comprehension and Writing Concepts and Skills.

Disrupted learning growth in measures of verbal and quantitative reasoning across student performance groups show an exaggerated version of the same pattern. As with CTP subject tests<sup>2</sup>, students in the bottom quartile of test performance in 2017–2018 experienced the most growth in reasoning ability the following year. Once again, the extent of score gains leveled out across the groups during the pandemic-disruptions of 2020. However, the strongest students exhibited greater gains than others in reasoning test scores: 7.6% for the highest-achieving group vs. 7.1% for the lowest group and 6.1% for the middle. The strongest students seem not to rely on teacher interaction as much as others to incorporate new knowledge into their reasoning process and for problem-solving success. See Figure 3.

### Figure 3

Percentage change in student scores by performance bucket.



National studies of COVID learning loss, based on test data from public school systems, have found even greater learning disruption among students from underrepresented groups and among girls, particularly in math. Although ERB does not require CTP test takers to specify their racial or ethnic identities, we are able to look for pandemic-related learning differences related to gender.

<sup>2</sup>The subject tests analyzed here are Math, Reading Comprehension, and Writing Concepts and Skills.



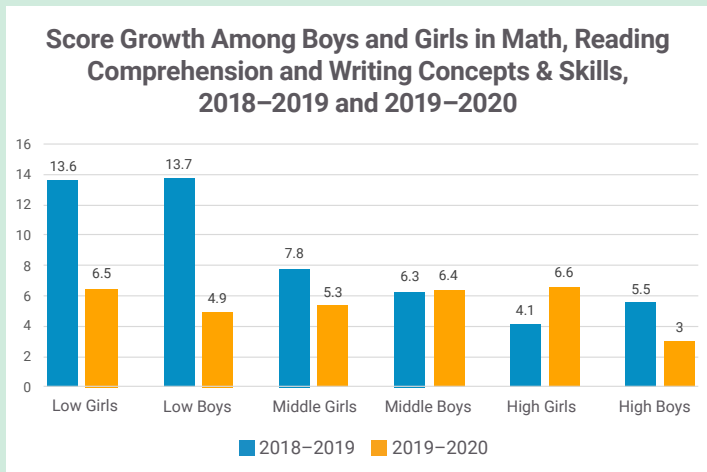
*reduced or eliminated classroom contact with the teacher has had the greatest impact on learning among the lowest-achieving students*

As we saw in Figure 2, reduced or eliminated classroom contact with the teacher has had the greatest impact on learning among the lowest-achieving students. This is true of both boys and girls. Learning growth among girls, however, suffered less under virtual and hybrid learning models than among boys in both the lowest and highest achieving groups. High-achieving girls managed a faster learning curve during 2020 than during the previous year. We found no differences in this pattern between Math and English Language Arts, contrary to the COVID learning loss data from public school systems. See Figure 4.

Girls were also more successful than boys in advancing their verbal and quantitative reasoning skills under virtual and hybrid conditions. Once again, reduction or loss of classroom interaction was felt most keenly by the low and middle student achievement groups. Among high-achieving girls, learning gains in quantitative and verbal reasoning were actually greater during 2019–2020 than they had been the previous year. See Figure 5.

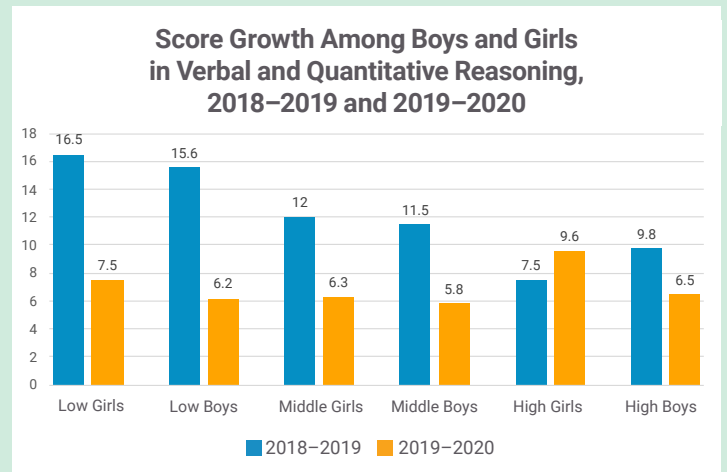
## Figure 4

Percentage change in student scores by performance bucket.



## Figure 5

Percentage change in student scores by performance bucket.





## Conclusion

As private and independent schools master the art of hybrid programming and begin to prepare for a post-COVID future, it will be important to incorporate instructional elements to compensate for the slowing of growth in student learning that began with school closures in March 2020. Once the typical level of direct student-teacher contact is re-established, it will also be important to focus particularly on quantitative and verbal reasoning skills: not just knowing the subject material, but also being able to apply that knowledge to solve new problems.

Moreover, educators will need to be even more attentive to the distinctive needs of different students as independent schools reestablish the central role of teacher-student classroom interactions while also retaining the most successful aspects of virtual learning. The lowest-achieving students have the greatest need of classroom interaction to maintain a pace of learning that enables them to catch up to others. The acceleration of learning growth by high-achieving students, girls in particular, also raises the question of whether and how to continue the relative independence of responsibility for learning that has been central to the virtual and hybrid educational experience.

This may not be true of all high-achieving girls, of course. Indeed, there is significant variation in learning outcomes for every group we examined. We plan to refine our analysis in the future by further distinguishing among students based on their social-emotional learning strengths and needs. This would help educators better understand and further individualize instructional strategies for each unique learner.



### Interested in exploring your school's data with the ERB experts?

Each school creates its own distinctive learning environment. Please contact ERB at [insights@erblearn.org](mailto:insights@erblearn.org) if you would like to understand more about the impact of virtual and hybrid instruction on the learning growth of students in your school.

