i-Ready®

Overcoming the Digital Divide

Distance-Learning Successes during the Pandemic

Curriculum Associates Research Brief | September 2020

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Research Overview

After schools shut down in March due to the COVID-19 pandemic, an unprecedented slide in student learning was predicted by some (Chetty, Friedman, Hendren & Stepner, 2020, Hobbs, 2020). Evidence began to mount that school closures would only increase the disparities in student access to high-quality instruction endemic in the United States and further disadvantage students living in poverty, who tend to be students who are Black and Latinx (Dorn, Hancock, Sarakatsannis & Viruleg, 2020; Walton Family Foundation, 2020; Mandery, 2020).

At Curriculum Associates, we are concerned about the well-being and academic success of every student, particularly those students living in poverty, affected by systemic racism, and historically underserved by our educational system. These communities were often the hardest hit by the COVID-19 pandemic (Artiga, Corallo, Pham, 2020, Center for Disease Control, 2020). Our approach focused on what *is working* for schools in these communities and what actions educators and communities can take to ensure their success.

In this research brief, we will explore how schools located in low-income areas—who primarily serve students who are Black and Latinx—used *i-Ready Personalized Instruction* (*i-Ready*) with the same level of fidelity during school closures that we would recommend during a typical school year. In some cases, we identified schools with strong usage who also had quality *i-Ready Diagnostic* (*Diagnostic*) data so we can show how students in these schools demonstrated growth in Reading and Mathematics achievement.

Once our Research team had uncovered these schools, our Educator Success team followed up by interviewing some of the school leaders to learn more. In particular, we were interested in finding out what these educators had done to continue to serve students and overcome what is being called the "digital divide" in this new era of distance learning. Across the board, these effective, humble educators insisted they were not going above and beyond but rather simply doing their jobs.

This emerging evidence suggests that students from every community—including those serving Black and Latinx students—can continue to stay connected, engaged, learning, and growing in spite of the headwinds exacerbated by the COVID-19 pandemic.

To learn more about evidence on the impact of *i-Ready*, please visit CurriculumAssociates.com/Research. For more resources on teaching and learning during the 2020–2021 school year, please visit CurriculumAssociates.com/Teaching-Learning-2020.

Introduction

As reported by EdSurge (Corcoran, 2020), our early research on the digital divide showed a significant drop in *i-Ready* usage in the initial weeks of school closures, which was in line with what other education technology vendors reported as well (McNulty, Baird, Udell, Sran, Tardrew & Gunn, 2020). Additionally, the change in *i-Ready* usage during school closures was largely dependent on school zip code. The drop-off in usage for students in schools in low-income zip codes was much greater than the drop-off for those in higher-income zip codes, and the subsequent recovery was much smaller for those in low-income zip codes (Curriculum Associates, 2020a).

Reflecting the racial and ethnic diversity across America, the majority of students enrolled in public schools are students of color (IES, 2020) . In the recent publication of *The Condition of Education 2020*, the National Center for Education Statistics (NCES) projected that beginning with the 2019–2020 school year, the distribution of students by race and ethnicity would consist of 44% White students, 28% Latinx students, 15% Black students, 7% Asian American (including students who are Pacific Islander), and 6% students who are two or more races. In the same publication, NCES reported that the percentage of students who attend high-poverty schools is highest for Black and Latinx students (45% each). As an educational technology provider for more than 2,200 school districts, Curriculum Associates serves more than eight million students, or 25% of the K–8 student population, through *i-Ready* alone.

The purpose of this study was to dig deeper into our large database of *i-Ready* instruction usage data during the spring 2020 school closures to learn more about schools in low-income zip codes serving primarily students of color. Our goal is to help all K–8 education stakeholders understand more about the possibilities for successful distance learning with students who have likely suffered from systemic racism, and moreover, to identify best practices we can share with other educators to encourage even more success for all students this coming year.

The data on race and ethnicity was sourced from NCES, which asks students to identify as American Indian or Alaska Native, Asian, Black or African American, Hispanic, Native Hawaiian or Other Pacific Islander, White, or Two or More Races. Throughout this paper, we will use the term "Black" to refer to the NCES category of Black or African American and we will use the term "Latinx" to refer to the NCES category of Hispanic. We recognize that language changes with time and that each demographic group described is not monolithic nor is each individual within any designated demographic group in agreement on preferred language. As a company, we will continue to review, reflect on, and evolve the terminology with the goal of using bias-free, inclusive, and sensitive language labels.

Research Questions

Faced with the extremely challenging circumstances brought about by abrupt school closures, we explored the following:

- How many schools in low-income zip codes with high proportions of students of color were able to demonstrate strong *i-Ready Instruction* usage during school closures?
- How many schools in low-income zip codes with high proportions of students of color were able to get quality Diagnostic data during school closures? For those that did, what were their growth patterns?
- What can we learn from speaking to educators and leaders at the schools we identified?

Methodology

i-Ready Usage Analysis

Our research began with a preliminary analysis designed to quantify the relationship between school-level demographic variables and consistent connectivity during school closures. Students were defined as "connected" if they used *i-Ready* in at least four distinct weeks during the first 10 weeks of school closures (March 15–May 22, 2020). The percentage of students within the school who were connected was used to define connectivity at the school level. See Appendix A for more detail on this analysis.

In parallel, we ran a separate analysis to determine whether any schools had accurate Diagnostic data from at-home testing in spring 2020. Anecdotally, we had heard that much of the at-home testing was compromised by well-meaning family members and caregivers helping students with their spring 2020 assessments. We intentionally limited our sample to only include Diagnostic data that met our high standards for data quality. See Appendix B for more detail.

Next, we examined *i-Ready* instruction data for the group of schools who stood out in terms of both staying connected and having quality Diagnostic data. By examining this data, we sought to empirically determine what would represent true engagement in distance learning for *i-Ready*. Based on the schools we identified by both of the aforementioned analyses, we defined strong *i-Ready Personalized Instruction* usage according to the following school-level criteria:

- At least 80% of students were connected.
- Median number of weeks of usage at the school level was at least six.
- Median number of completed lessons was at least 15.
- Median time spent across both subjects was at least 500 minutes.
- Lesson pass rate, across all lessons, was at least 70%.

Schools that met the above criteria were included in the final analytic sample for the *i-Ready* usage analysis. A subset of schools who were in the final analytic sample for *i-Ready* usage *and* had quality Diagnostic data were included in the Diagnostic growth sub-analysis.

Educator Interviews

Once the Research team had identified the final sample of schools, our Educator Success team set up a series of interviews with some of the school building leaders at these schools. While we tried to contact as many educators as possible in a short time frame, we were only able to speak with 25 educators at eight schools in seven districts at the time of publication. As such, our qualitative sample is one of convenience.

It is important to note that many more extraordinary schools and exceptional educators likely achieved similar results and helped tens of thousands of students in need. We recognize that many educators and students faced digital inequity that was difficult if not impossible to overcome, thereby limiting our pool of available schools to include in the *i-Ready* usage analysis. In addition, with schools across the country eliminating spring testing in 2020, the available pool of schools to research for the *i-Ready Diagnostic* growth analysis was dramatically reduced.

Results

i-Ready Usage Findings

The Research team began with a sample of 9,501 schools using *i-Ready* during the 2019–2020 school year. Of these, 1,321 (14%) met the above criteria for strong *i-Ready* usage during the school closure period. We wanted to focus our research lens on only those schools in low-income zip codes (defined as median annual household income below $50,000, according to publicly available US Census data) and who served a high percentage of students of color (defined as schools with a population of less than 25% White students based on publicly available school-level data from NCES). This drill-down resulted in a subset of 2,210 schools (23% of the total sample). Of these 2,210 schools, nearly 200 schools (n = 198, or 9%) in low-income zip codes serving primarily students of color met the criteria for strong *i-Ready* usage.

The 198 exemplar schools were located in 15 different states across the country. The schools were mostly split between suburban areas (n = 112 or 57%) and cities (n = 79 or 40%) with the remainder located in towns and rural areas (4%). While all four US Census geographical regions (i.e., West, Midwest, South, and Northeast) were represented, the vast majority of these schools were located in Florida (n = 162). Our exemplar schools also hailed from New York (six), Colorado (five), California (four), Ohio (four), Rhode Island (four), Connecticut (three), Georgia (two), Nevada (two), Alabama (one), Illinois (one), Mississippi (one), New Jersey (one), New Mexico (one), and Pennsylvania (one). See Table 1 for more detailed exemplar school characteristics.

Table 1. Exemplar School Characteristics (N = 198 Schools)

Demographic Variable	Average	Range
% Black Students	35%	0%–100%
% Latinx Students	48%	0%–99%
% White Students	3%	0%–25%
% Asian	1%	0%–45%
% American Indian or Alaska Native	0%	0%–2%
% Hawaiian or Pacific Islander	0%	0%–1%
% Two or More Races	1%	0%–10%
Median Annual Household Income	$39,900	$18,920–$49,984
Total Student Enrollment	606	218–1,623

The results of this study show that schools in low-income zip codes—whether in a city, suburb, town, or rural locale—serving primarily students of color kept up with the standard *i-Ready* usage guidance in spite of operating remotely during a global pandemic. Based on the inclusion criteria alone, the exemplar schools all used *i-Ready Personalized Instruction* for at least 42 minutes per week per subject (Reading and Mathematics), with lesson pass rates of at least 70%. This usage tracks perfectly with our recommended guidance during a typical school year, which recommends that students average 30–49 minutes of *i-Ready* usage per subject per week and try to pass at least 70% of their online lessons. See Table 2 for the average and range for each of the *i-Ready Personalized Instruction* usage inclusion criteria.

Table 2. *i-Ready Personalized Instruction* Usage in Exemplar Schools ($N = 198$)

***i-Ready* Usage (Reading and Mathematics)**	**Average**	**Range**
% of Students Connected	88%	80%–100%
Median # of Weeks	8	6–10
Median # of Lessons	34	15–92
Median Total Time-on-Task	1,003 minutes (17 hours)	515–2,712 minutes (9–45 hours)
Lesson Pass Rate	81%	71%–88%

i-Ready Diagnostic Growth Findings

The Diagnostic growth analysis began with a sample of 874 schools who administered the Diagnostic for Reading and 800 schools who administered the Diagnostic for Mathematics in spring 2020. Of these schools, we found 75 schools in Reading and 45 schools in Mathematics that met our criteria for data quality in at-home testing with at least three grade levels. For the purposes of this study, we wanted to look more closely at Diagnostic growth among the exemplar schools. Our analysis revealed 16 schools of the exemplar schools in low-income zip codes serving a high proportion of students of color that had both strong *i-Ready* usage and high-quality Diagnostic data. To examine growth, we looked at student growth in 2019–2020 as a percentage of the growth observed during the 2018–2019 school year. Even with the interrupted education and distance learning caused by school closures, these 16 schools made growth relatively consistent with the prior year. In Reading, these schools achieved 108% percent of the previous year's growth. In Mathematics, these schools achieved 88% of the previous year's growth. One interpretation of this growth is that learning loss is not inevitable. Educators are finding ways to support their students amidst a public health crisis, while also navigating economic challenges and systemic oppression. See Table 3.

Table 3. Comparison of Diagnostic Growth Patterns (2018–2019 and 2019–2020 School Years) (*N* = 16)

	Fall to Spring Diagnostic Growth			
	Median Fall to Spring Scale Score Change 2018–2019	Median Fall to Spring Scale Score Change 2019–2020	Year-over-Year Scale Score Difference	2019–2020 Student Growth as a % of 2018–2019 Student Growth
Reading	24	26	2	108%
Mathematics	24	21	-3	88%

Educator Interviews: Emergent Themes

The analyses above helped lead us to what looked, on paper, like success stories. However, we know that data can only tell part of the story, especially in the world of education research. We knew that we needed to hear from the educators in the schools who emerged through our empirical investigation to learn more about what they did to overcome the digital divide and demonstrate that distance learning is not only a possibility, but also a reality. To learn more, our Educator Success team set up a series of interviews with school building leaders at seven of the 198 schools. After conducting hours of interviews to learn from their practice, the following themes emerged:

1. **All technological barriers for students and families were eliminated.** *Through deliberate planning and external partnerships, every student was given a device, ensured access to the internet through hotspots and information technology staff for support, and received Individualized Education Program accommodations.*
2. **A relentless commitment to personally reaching every single family was maintained throughout the spring**. *Educators found ways to reach their students' families in a variety of ways that were relevant to the families' situations: Hundreds of home visits, keeping school doors open for questions and visits, thousands of phone calls and texts, data chats via videoconferencing software, translation and pictorial resources, virtual proctoring, and all staff having an "all hands" attitude.*
3. **Feedback loops of instruction, learning, and assessment were integrated into everything they were already doing as a school before COVID-19.** *"Our students knew what to do—we just had to transfer that expectation to families."* —Dr. Burth, Assistant Principal, West Homestead K–8 Center, Miami-Dade County Public Schools
4. **Educators followed up, held everyone accountable, and celebrated progress on lessons.** *When a teacher could not reach a student or family, they elevated it to their principals and assistant principals, and they would follow up. Administrators were constantly looking at online instruction data and met frequently with teachers to discuss. Educators found creative ways to celebrate students, including public announcements, social media posts, and sending certificates and awards in the mail.*

We are continuing to learn from educators about what worked during COVID-19-related school closures this past spring. We plan on releasing further publications highlighting individual case studies based on the interviews our Educator Success team is continuing to conduct.

Discussion

As we begin another academic year, we know educators everywhere want to know what they can do to keep students learning and growing whether in remote, hybrid, or traditional environments. There is a growing body of resources to guide schools as they begin the 2020–2021 school year (CCSSO, 2020; CGCS, 2020; CASEL, 2020; Kim & Choi, 2020). Across the board, the researchers and practitioners we have worked with recognize the importance of providing support for students' academic and social-emotional needs, particularly for students who are likely to receive lower quality educational experiences. Critical to students' academic success is receiving grade-level content and individualized instruction (TNTP, 2018). While not new, these educational goals are more urgent than ever.

In many ways, the 2020–2021 school year is extraordinarily different due to the intertwined effects of the education, public health, and economic crises affecting students, teachers, leaders, and entire communities across the country. As educators, we must remain cognizant of the interaction between the old wounds of systemic racism and the more recent harm that the coronavirus and school closures have wreaked on students everywhere. And yet, as researchers, we must also move away from reinforcing a deficit mindset by adding to the discourse on racial achievement gaps with more data points that ignore structural inequities (Quinn, 2020).

A recent survey on technology as a pandemic recovery resource found that what educators want most is to receive wisdom about which technology tools to use and how to use them from contextual peers (EdTech Evidence Exchange, 2020). Our findings from this study demonstrate how *i-Ready* can be an effective online instructional resource for students of color in low-income zip codes by continuing to individualize instruction even while students remained at home. The findings from our interviews with educators offer a window into how powerful *i-Ready* can be in the hands of educators as part of a thoughtful distance-learning curriculum.

Distance learning cannot replace the value of traditional in-person education, but programs like *i-Ready* can be used asynchronously (when connectivity and devices allow) so the time students spend on video chats with teachers and classmates can focus on their social-emotional and other academic needs. We recognize that *i-Ready* is a supplemental instructional tool that is useful but insufficient on its own, but we believe the results we have shared thus far are of value to the entire education community and we invite discourse on our approach and results interpretation.

Limitations

We recognize that we are reporting the findings of only a fraction of schools using *i-Ready* during the pandemic. We felt it was important to highlight the greatest success stories that we could find among our *i-Ready* user base during school closures. Additionally, while we thought carefully about each inclusion criteria, we also wanted to work quickly. As a result, we were unable to include every variable we would have liked to include (e.g., teacher usage characteristics and student perspectives). We acknowledge there are other variables from our system along with contextual variables that would be helpful in understanding data usage and growth trends more thoroughly.

Due to how we identified success cases for the spring Diagnostic (i.e., requiring three or more grade levels), some middle schools that only have two grade levels were automatically eliminated from consideration and it was more difficult for middle schools with three grade levels to be included. We did not look at high school at all. Additionally, our decision to collapse *i-Ready* usage across both Reading and Mathematics may have rendered within- and between-subject trends unobservable. For the Diagnostic analyses, some schools saw maintenance of growth in one subject area but not the other. Finally, our sample is of course limited to our userbase, which, while large, is not a statistically representative sample thus, it is not generalizable across the United States.

Conclusion

We are impressed by the educators and students at the exemplar schools we identified through this research. However, we realize that 198 schools may be perceived as small in number and that in far too many places, students don't have access to devices and systems haven't been able to adapt to online instruction. We also recognize that learning loss is going to be a reality for many students, including some students using *i-Ready*, and we will explore how school-level responses to the pandemic may have protected students from or possibly exacerbated typical summer learning loss as more Diagnostic data becomes available this fall. Far too many students suffered educational inequities before the pandemic and far too many are now experiencing worse.

But it doesn't have to be that way. This research study revealed some positive findings, and we anticipate that with more educator interviews, there will be more success stories to be told. We have always been interested in learning from educators who are committed to using data to provide more equitable education and refusing to subscribe to the predictability of failure. Our plan is to keep talking to and learning from a growing group of classroom and school leaders and share their best practices with other educators to improve outcomes for all students, including and paying particular attention to students who need efficient pathways to make up for years of disservice. Our goal here is clear: We will continue to follow the data and strive to honor our mission to help students and teachers everywhere.

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Appendix A

Connectivity Analysis Methodology

For this analysis, we wanted to lay the groundwork for quantifying the relationship between school-level demographic variables and consistent connectivity during school closures. Students were defined as "connected" if they used *i-Ready* in at least four distinct weeks during the first 10 weeks of school closures (March 15–May 22, 2020). The percentage of students within the school who were "connected" was used to define connectivity at the school level. Specifically, the following variables were used to predict school connectivity:

- Proportion of students who are White
- Proportion of students who are Black
- Proportion of students who are Latinx
- Median annual household income of the school's zip code
- Total enrollment of the school
- School locale code (i.e., city, suburb, town, rural)
- Highest grade level in the school (elementary through middle schools)

Using this model, we calculated connectivity rates, as predicted from the school demographics, and built a 90% confidence interval around this prediction. If a school's actual connectivity rate was greater than the prediction, and outside of the confidence interval, the school was labeled as a positive outlier: these are schools that saw significantly more students getting connected than would be predicted by their demographics. The school connectivity analyses yielded 147 positive outlier schools.

The results of this analyses were not directly used in this study. However, this analysis, when combined with the Diagnostic analyses described in Appendix B, was critical to helping us arrive at the criteria for good *i-Ready* usage during a time of extremely out-of-the-ordinary schooling situations. Specifically, the overlap between the connectivity list of schools and the quality Diagnostic administration list of schools, along with knowledge of our typical implementation guidance, helped us define "strong *i-Ready* usage" during school closures.

Appendix B

Spring Diagnostic Success Cases Methodology

For this analysis, we were interested in looking at the quality of data from students' at-home testing during spring 2020. In particular, we were concerned with only including data in whose quality we were confident. Anecdotally, we had heard that much of the at-home testing was compromised by well-meaning family members and caregivers helping students with their *i-Ready Diagnostic* spring assessment. This was borne out in the data, as generally we saw more growth than we would have expected, particularly for the early elementary Grades K–2. We looked at the relationship between fall and spring scores for each grade/subject at a school in 2019–2020 and compared it to the relationship between fall and spring scores for 2018–2019. Specifically, we looked at three factors:

1. The absolute correlation between fall and spring scores in 2019–2020. Schools that had a correlation of .60 or above were identified as having a sufficiently strong fall to spring relationship to make scores potentially valid for interpretation.
2. The difference between the correlation of fall and spring scores in 2019–2020 versus 2018–2019. Schools whose 2019–2020 correlation was within .10 of their 2018–2019 correlation were determined to have a sufficiently consistent pattern of student performance to make scores potentially valid for interpretation.
3. The median amount of student growth (fall to spring) for 2019–2020 compared with the median amount of student growth (fall to spring) for 2018–2019. Schools whose median growth this year was not greater than 10 points higher than their median growth last year showed a sufficiently consistent pattern of student performance to make scores potentially valid for interpretation.

While we wanted to allow room for schools to demonstrate real year-over-year growth, the third criterion was important to ensure that we did not include schools in whose scores were inflated due to construct irrelevant factors (e.g., family member assistance). Any school who met these criteria across three or more grade levels was flagged as a potential success case. Note that a minimum sample size of 30 students per grade/subject across fall and spring for each of the last three years (2017–2018, 2018–2019, and 2019–2020) was required for a school to be eligible for evaluation. The Diagnostic Success Cases analysis yielded 75 schools in Reading and 45 schools in Mathematics.

Built to address the rigor of the new standards, *i-Ready* helps students make real gains. *i-Ready* collects a broad spectrum of rich data on student abilities that identifies areas where a student is struggling, measures growth across a student's career, supports teacher-led differentiated instruction, and provides a personalized instructional path within a single online solution.

To learn more about evidence on the impact of *i-Ready*, please visit CurriculumAssociates.com/Research.

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