

Infrastructure Usage Study Brief

K-12 Education | August 2020



MAKING THE CONNECTION

How Intel-based Infrastructure, Security Features, and Device Solutions Support Remote Teaching and Learning

If you asked any educator ten years ago what teaching would look like in 2020, you'd be hard pressed to find anyone that would have come close to predicting what we are currently experiencing during the "COVID-19 Age" of education. It's much more than simply adopting remote learning. It's a complete sea change in how teachers teach, and how learners learn.

School districts across the U.S. have weathered the first phase of this new era—reacting to a global pandemic with the resources at hand, and innovating in real time to create some semblance of "the classroom" for students.

But the very idea of "school" is going to look very different this fall.

About — This brief was created by Intel to help K-12 education decision-makers further explore the challenges and opportunities for change presented by the COVID-19 pandemic.



“ The 2020-2021 school year could feel like it's full of snow days...if we had no ability to predict the weather and snow could happen at any time and any place.”

— **Justin Fogarty**
VP of Communications
at *The Math Learning Center*.



New Rules for Schools

Regardless of a district's unique roll-out strategy, remote learning is almost guaranteed to be a major part of the equation. Mike Magee, the CEO of [Chiefs for Change](#)—a nonprofit, bipartisan network of diverse state and district education chiefs—says, though impossible to predict, it would be foolhardy to not have some strong distance learning strategy at the ready. “We don't have a single member who is not planning for some amount of distance learning next year.”

The first technology-related issue many districts have had to grapple with is determining how best to get devices into the hands of students who need them. While some districts are focused on one operating system or platform, many use a variety of the three major education systems —Microsoft Windows*, Google Chrome*, and Apple iOS*—across their technology ecosystem. Managing the huge number of devices going home, integrating existing devices that students already have access to, and ensuring connectivity are challenges that schools will continue to struggle with as they prepare for the coming school year.

Network Support

Next, there is the issue of the infrastructure needed for remote learning that most district IT departments have to support. What are the bandwidth considerations? How do IT departments need to modify their network configuration to enable remote access? What security risks and potential threats to privacy do these changes pose? While students and teachers may be utilizing home internet services for at least some of the school year, many school districts simply lack the infrastructure to effectively deliver online instruction. And, what of the demands on administrators and support staff?

Logistical Woes

Then, there are the logistics involved with proposed rotation schedules. Let's say that a district were to host half of a school's student body on Mondays and Tuesdays, with the other half attending Wednesdays and Thursdays, and each half attending on alternating Fridays. How are schools to assure consistency in this sort of blended implementation? How and when are remote learning resources developed and deployed to maintain learning at home? Are teachers required to work longer hours to support both on-site and online learning? Will more staff be required? Rotation schedules may also receive scrutiny and pushback from teachers' unions.

After remote and blended learning solutions are implemented, how will educators and administrators gauge student and systemic efficacy? A recent *Wall Street Journal* article [“The Results Are In for Remote Learning: It Didn't Work”](#) has already called out several problems encountered with remote learning. But what were the alternatives? Simply not schooling? Or pretending the pandemic didn't exist and maintaining business as usual, putting countless lives in danger? To move forward so that remote learning can grow and flourish, schools need analytics and data to judge what's working and what's not working.

Equity Considerations

Ensuring equity and consistency with remote learning is a significant challenge. For example, broadband is not dependable across New York's five boroughs, much less within our nation's many rural districts. Another example: Southern California has the largest foster child population in the country—nearly 50,000— as well as a significant homeless student population. And what about teachers? Many educators lack dependable connectivity at home as well, which can seriously undermine remote learning. Yet while the challenges are formidable, virtual classrooms may indeed be an equity opportunity.



Opportunities for Change

For the 2020-21 school year, schools are working to transition from an emergency school closure response approach, to a more comprehensive approach that values the quality and continuity of learning while prioritizing students' social, emotional, and mental health needs.

Step one in establishing a high-quality remote learning environment is, of course, the availability of devices that can deliver rich, remote learning experiences. The pandemic presents challenges in getting these devices into the hands of administrators, teachers, and students promptly.

Today's districts need to be more resilient and agile than ever before. While IT infrastructure has far too often been the third wheel of K-12 decision making, it must allow for seamless expansion and contraction to ride the new ebb and flow of demand. Even apart from remote learning scenarios, most every district device is used in some sort of hybrid fashion, everything from interacting with an on-prem Student Information System to connecting with cloud-based services and Learning Management Systems.

Connectivity is another part of the equation. In addition to learning devices, students and faculty often also need phones and tablets connected to school networks, meaning that districts should plan on supporting roughly three devices per student/faculty. Los Angeles Unified School District, for instance, has invested resources into their infrastructure and are looking to upgrade to Intel® WiFi 6 (which boosts speeds for individual devices by improving networks).

Intel® Solutions

Silicon-enabled security technologies ensure hardware platform integrity so that schools and districts can better protect sensitive student-related data and detect threats. Discover a robust array of Intel's [security services and hardware-based solutions](#).

The Zero Trust Security Model

Ensuring data privacy in differing learning environments is top of mind with today's education decision makers. This means remotely handling sensitive information while adhering to [CIPA](#) (Children's Internet Protection Act) and [FERPA](#) (Family Educational Rights and Privacy Act) guidelines.

One approach to address both security and data privacy is to embrace the [Zero Trust Model](#). Zero Trust is exactly that: *having no trust in anyone or anything that could possibly breach data security*. This approach requires an integrated defense strategy that takes into account such threats to security as the cloud, where sensitive data is shuttled back and forth (oftentimes between an on-premises school network and outside locations). Data security perimeters are seldom clearly defined due to applications and data stores that can be both on-premises and in the cloud (which could either be public, private, or a hybrid), with users accessing them from multiple devices and locations. This could impact a number of tasks such as accessing VPN for mission-critical applications, and even HR issuing payroll safely in a remote environment. Another consideration might be concerns that pushing too much data up in the cloud could prove expensive in the event it needs to be pulled down again.

Intel vPro® Platform

Security and privacy used to be viewed as a perimeter defense issue. But now, in this age of COVID-19, many devices are "out in the wild" to support remote learning. Many employees are performing management tasks inside the school system, yet often updating outside sources. Student Personally Identifiable Information (PII) will undoubtedly end up on devices outside of school, requiring hardware-based security.

[Intel vPro](#) is of interest to today's schools and districts, especially with HR and administration operating remotely. The Intel vPro® family of processors offers enhanced security in the form of multi-factor authentication, full disk encryption, and Remote Secure Erase. School IT and faculty will appreciate it's remote managed support abilities, which allows remote updating and repair of equipped devices.

Intel Unite® Solution

The [Intel Unite solution](#) enables seamless collaboration, as well as fast and easy content sharing for teachers and students with video playback with audio. It also provides broad OS coverage for teachers and students while allowing educators to control student sharing privileges. The simplicity, reliability, and versatility of Intel Unite enable teachers to reclaim instructional minutes all without giving up control.

Intel® Wifi 6 Technology¹

Wi-Fi 6 is a substantial upgrade over previous generations of Wi-Fi, offering many incremental improvements resulting in faster upload and download speeds due to increased bandwidth.

Wi-Fi 6 brings wired and wireless signals closer to parity, resulting in maximum potential speeds up to 40% higher than Wi-Fi 5¹. Intel Wi-Fi 6 technology achieves these higher data transfer speeds through more efficient data encoding and intelligent use of the wireless spectrum made possible by more powerful processors. It also improves speeds by handling large amounts of network traffic more efficiently, communicates better with multiple devices that need data simultaneously, and more efficiently prioritizes traffic across those devices.

Professional Development Resources from Intel®

- [Intel Teach Elements](#) are free, just-in-time professional development courses offering a deeper exploration of 21st century learning concepts: empowering teachers to integrate technology effectively into their existing curriculum, focusing on their students' problem-solving, critical thinking, and collaboration skills.
- To help educators keep pace with current educational practices, the [K-12 Blueprint](#) provides robust toolkits loaded with step-by-steps and program frameworks, each focusing on a critical challenge.
 - Resources and materials to help school technology leaders make the best decisions to ensure the safety of every student
 - Helping educators utilize computational thinking in their classrooms so that students can solve problems in creative and innovative ways
 - The digitalization of the learning experience so that both teachers and students are able to improve their skills to create a more engaging and effective education process

Devices for Learning

Choosing the right devices for learning and teaching has always been instrumental in providing personalized and relevant learning experiences. Now this decision is made all the more crucial in a remote learning scenario.



Good

Chrome OS and Windows devices for students with Intel® Celeron®, Intel® Pentium® and Intel® Core™ i3 processors



Better

Windows-based devices for educators and administrators with Intel® Core™ i5 (or better) processors



Best

Intel® Core™ i5 or better-based devices with Intel vPro® have the compute power to better support collaboration, multitasking, video conferencing, and even processor-intensive activities such as esports

Discover additional resources at
www.Intel.com/education



¹ The quality of a wireless network is only as strong as its weakest connection. Choose PCs and wireless access devices powered by premium Intel® Wi-Fi 6 (Gig+) technology for best-in-class wireless connectivity. See intel.com/wi-fi6 for additional details.

Intel technologies may require enabled hardware, software or service activation. No product or component can be absolutely secure. Your costs and results may vary.

© Intel Corporation. Intel, the Intel logo, and other Intel marks are trademarks of Intel Corporation or its subsidiaries.

*Other names and brands may be claimed as the property of others.