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PCM-G THE RIGHT TECHNOLOGY, DELIVERED

Best Practices for Integrating Chromebooks into Teaching & Learning

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Chromebooks, the lightweight laptops that run software from the internet instead of a local hard drive, have skyrocketed in popularity within the last few years—and in the second half of 2014, Chromebooks surpassed iPads as the most popular devices sold to U.S. schools.

Worldwide sales of Chromebooks are expected to reach nearly 7.3 million units in 2015, up 27% from 2014, according to technology research firm Gartner Inc. Education is the single biggest market for Chromebooks, with schools accounting for 60% of U.S. Chromebook sales in 2014.

In this white paper, we'll look at why Chromebooks are so popular among schools. We'll also explore some of the biggest challenges to implementing Chromebooks in education—as well as best practices and keys to success.

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WHY CHROMEBOOKS?

Chromebooks run on Google's Chrome operating system, and they deliver applications over the internet through a software-as-a-service model. All information is saved in the cloud continuously as students work, and software updates occur automatically.

Chromebooks are solid-state devices, but they offer Flash storage, so students and teachers can work offline as well. What's more, the devices boot up quickly, so very little class time is wasted waiting for the machines to operate.

Low cost

According to K-12 administrators, the No. 1 advantage of Chromebooks is their low cost. In a national survey of more than 700 school and district leaders in June 2015, 96% cited "affordability" as a key benefit of the devices—by far the most popular response.

96% cited affordability is main benefit of Chromebooks

With Chromebook options starting around $199, schools can afford to buy more of the devices for the same amount of money, getting technology into the hands of more students.

Ease of use

Access to Google Apps was the second-most-often cited benefit of Chromebooks, at 83%, followed by ease of deployment (81%), boot-up time (71%), and portability (69%).

"Teachers love the (Chromebooks') ease of use, quick response time, and less technical difficulty than Windows," one survey respondent wrote. "Kids miss some Windows functionality, but overall they are happy with the devices and Google Apps versus Office."

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For technology to transform instruction, "it needs to be seamless," said Greg Desilets, a senior sales manager for PCMG. "When a teacher has a problem with the technology, then it's a distraction—and it's back to using textbooks. You certainly don't want technology impeding the teacher's lessons."

Because it's browser-based, Desilets said, a Chromebook offers users this kind of seamless experience. "You don't have to worry about the problems you would have with a standard computer," he said, such as crashes or viruses that target the device's operating system.

Ease of management

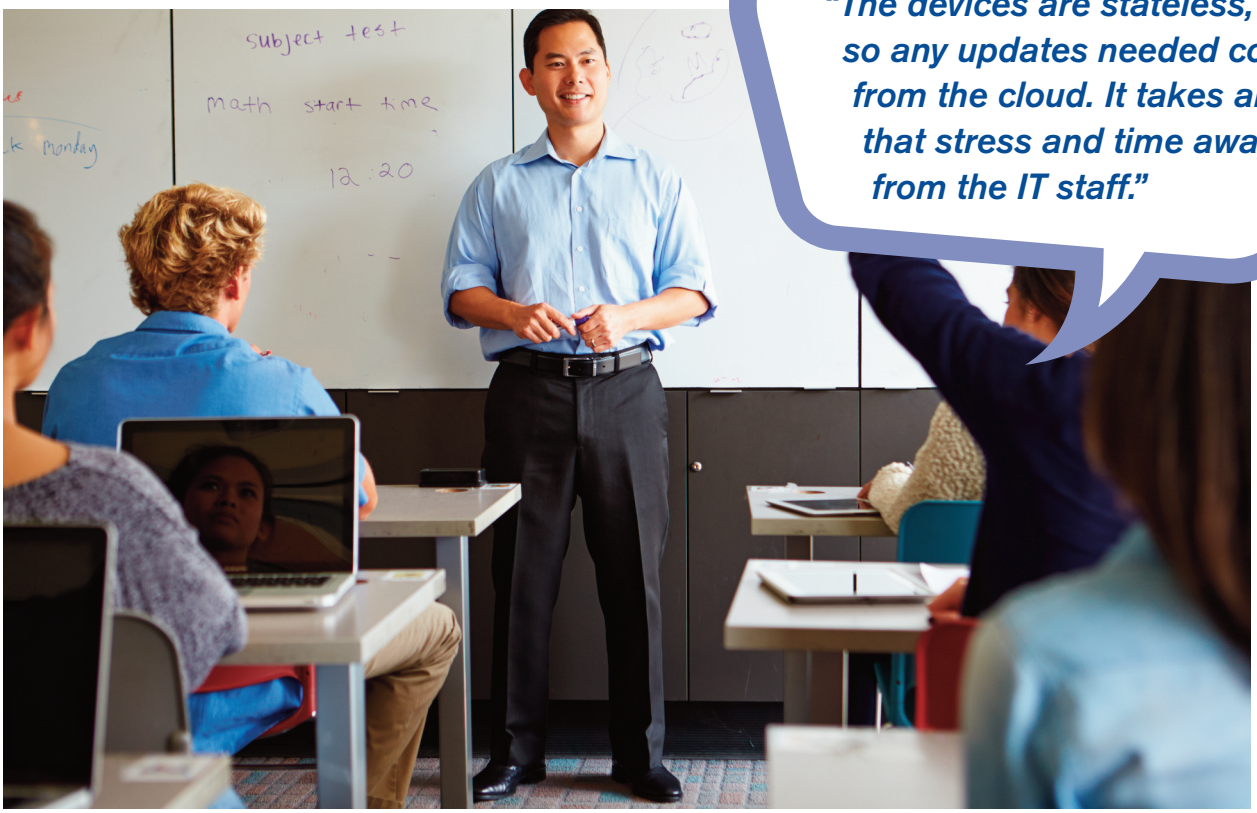
For 56% of survey respondents, the central management capability of Chromebooks is another key advantage.

Using a single interface, school information technology (IT) staff can create user groups, push out applications to students' devices, blacklist or whitelist applications, track assets, manage logins and passwords, and change network and device settings. The Google management console allows IT administrators to change or upgrade every Chromebook at once, or to target groups of Chromebooks or even a single device.

School IT leaders don't just save time in managing and provisioning Chromebooks; they also save time in troubleshooting.

"In some of the schools that I've worked with, they were spending 50% to 60% of their time just re-imaging computers with problems owing to student misuse, viruses, and so on. Re-imaging was a heavy burden on the IT staff," Desilets said.

With Chromebooks, this isn't necessary. "You don't have an image to load," he explained. "The devices are stateless, so any updates needed come from the cloud.
It takes all that stress and time away from the IT staff."



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CHALLENGES TO IMPLEMENTATION

By a wide margin, survey respondents identified teacher training as their top challenge when implementing Chromebooks.

Nearly two-thirds (64%) said this was something they struggled with, followed by not having enough devices for all students (50%). But two out of three respondents (66%) also said they have been able to resolve these challenges—for the most part.

"It's a work in progress," one said.

66% reported success in overcoming their challenges implementing Chromebooks

Staff training

To resolve the training challenge, most K-12 leaders said their schools have implemented professional development programs of some kind. Workshops focusing on the instructional use of Chromebooks were reported by 63% of respondents, and workshops focused on their technical use were reported by 53%. Other training methods included in-classroom support (50%) and one-on-one instruction (47%).

Because Chromebooks represent a departure from the traditional computing model that many teachers are familiar with, in which they save files and store software to a local hard drive, it can be challenging for them to adjust to a new mindset, where they are saving files to Google Drive and using only Chrome-based apps.

"Teachers are slowly but surely getting used to the Chromebooks, but cloud computing has been a big paradigm shift for many of them," one respondent said.

Of course, learning how to use the technology is only the first step. Teachers also must learn how to integrate Chromebooks into their lessons in pedagogically sound ways, taking advantage of the devices to support student inquiry and collaboration.

Giving teachers time to explore the use of Chromebooks and to find Chrome apps and extensions for use in their classrooms can help them become more comfortable with these tools.

"We gave our teachers Chromebooks six months before the students, so they could get over their own fears," one respondent wrote. Another wrote, "Teachers need to experience them firsthand" if they are to change their instructional practices.

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Software compatibility

Yet another key challenge, identified by 22% of survey respondents, is the lack of compatibility with software currently used by their school districts. "The biggest issue we face is using our (legacy) apps that are class-specific," one K-12 leader wrote. But that doesn't have to be a problem, thanks to virtual desktop infrastructure (VDI) technology.

"You can use VDI clients with Chrome and use Chromebooks as thin-client machines," Desilets said. "So the restriction that you can't use native applications is really just in people's minds. And the user experience, with the upgrades now available in both Citrix and VMWare, is really the same as if you have a full operating system."

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KEYS TO SUCCESS

From decades of research on technology in education, some clear best practices have emerged—and these same practices can guide schools' Chromebook use as well. Here are three important strategies for success.

Let the curriculum guide your choice of tools.

"A common mistake that many schools make when using any type of technology is not asking: Why are we doing this?" Desilets said. "Aside from online testing, do you have a plan for how you will use the internet and online applications?"

Many schools acquire technology before they have a well-developed plan for how these tools can support and enhance teaching and learning. They leave it up to teachers to figure this out, with very mixed results. But when you begin with your learning goals in mind, and then you choose technology tools and apps that can help teachers and students achieve those goals, you are much more likely to realize success.

Tom Daccord is the co-founder and director of EdTechTeacher, a professional learning company that helps educators use technology effectively. He recommends that you start by describing your vision for teaching and learning: "What skills do you want students to learn? What do you want them to be able to do, and how do you want them to demonstrate their learning?" Then, help teachers choose tools and apps that can support this vision.

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Because they integrate well with Google Apps, Chromebooks are effective platforms for online collaboration, he said. But there are many high-quality Chrome apps and extensions for creating and publishing as well.

Focus on change management.

In a landmark 2010 study, Project RED looked at technology use in nearly 1,000 U.S. schools. The organization's research aimed to identify the factors that made some ed-tech initiatives more successful than others. Its findings suggested that schools with one-to-one computing programs outperformed the others—and nine key factors led to even greater success.

One of those nine factors is strong principal leadership, including a focus on change management. Applying this idea to Chromebooks, principals should provide ample time for teacher development, collaboration, and experimentation—and they should model and champion Chromebook use in their schools.

"Schools that give teachers both a vision for using Chromebooks and time to experiment with the devices tend to be more successful," Daccord said.

Strong leaders also build a consensus around their vision, and they get their staff to buy into the district's goals. "If there is agreement on the learning goals and how to use Chromebooks to support those goals, then it's much easier to move the program forward," he said. "But if teachers are going in different directions, you can't move forward."

Make sure you have a robust network infrastructure.

"Because Chromebooks are web-based, it's critical that schools have a stable, robust connection to the Internet," Daccord said. "Think carefully about where those devices will be used in your buildings—and make sure you have the capacity for multiple students to log on at once."

To support Chromebook use in schools, "make sure that you properly plan the bandwidth needed for your schools—you need a robust pipeline to and from the Internet—and make sure that your wireless density is set up properly, so that you have enough access in the classrooms," Desilets said. PCMG can help schools perform a wireless site survey to analyze their coverage and determine whether they need to increase the density of their access points.

If you can't afford to upgrade your wireless networks to support all students at once, consider staggering your rollout by starting with certain grade levels, Daccord said. As your network improves, you can build the program out and introduce more Chromebooks.

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"It can be very frustrating and can dampen enthusiasm for using technology if the network is not robust enough," he cautioned. "The first few months of any new initiative are critical to its success."

COMING SOON...

In the next few sections of this comprehensive guide to using Chromebooks in education, we'll take a closer look at successful programs from the classroom, school, and district perspectives.

ABOUT PCMG

For more than 25 years, PCMG has been serving the needs of educational institutions, providing solutions from 21st-century classroom technology to operational technology infrastructure. Our goal always is to offer the leading solutions and services at competitive prices, with fast delivery and outstanding service, including these Chromebook preparation services:

White Glove Service – prepares Chrome devices for teachers and students so they are ready to use right out of the box.

Etching and Asset Tagging Service – ensures Chromebooks are easily identifiable with your school logo, name or property information.

From Chromebooks to the data center—and everything in between—PCMG offers what you need to meet your school's IT mission.

For more information, visit www.pcmg.com or call 800-625-5468

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