Classrooms, Chromebooks, and the Web: Lessons from Miami to Malaysia

Executive Summary

In recent years many innovative education systems have taken major steps toward advancing the use of technology in schools. As just one example, Malaysia articulated an **Education Blueprint 2013-2025**, which includes expanding educational opportunities by providing every student in the country with access to a computing device and a web connection.

This paper provides insights from Malaysia and school systems around the world that have chosen Chromebooks to bring the power of the web into the classroom. These lessons may be helpful to other regions on their own education technology journeys.

If you are a leader looking to change education through technology on a national or regional level, please **contact Google** (http://goo.gl/AXSAM) to start a conversation today.

Google™ in Education

"[T]he Internet is, and will remain over coming decades, one of the biggest drivers of global economic growth."
—Internet Matters: The Net's sweeping impact on growth, jobs, and prosperity (McKinsey & Company, 2011)

Learning on the Web

Parents, educators, and leaders around the world often have the same aspirations – to give their students the best opportunity to learn, find their passions, and collaborate with their peers.

With the right tools, this is increasingly possible today. Constant, dependable access to the web can help make teaching and learning much more accessible and collaborative.

Not long ago, knowledge was stored in printed books, updates were infrequent, and physical access to these materials limited what students could learn. Today, the web contains the collective knowledge of the whole human race. Students have access to many powerful resources, including 24 million **Wikipedia** articles, 100,000+ free e-books on **Project Gutenberg**, free online courses through such sites as **Saylor Foundation**, and hundreds of thousands of educational videos on **YouTube EDU**.

The web can also connect anyone, anywhere in the world. Students and teachers can learn, share and work across social, economic, and geographic divides. The web differs from traditional, closed platforms because it is:

- **Open** – Educational resources can easily be published, curated, and shared by educators worldwide, so the best content is available to everyone on multiple devices
- **Cost-effective** – High-quality resources are available globally and at the lowest costs
- **Collaborative** – Students, teachers, parents, and even digital pen pals work together, communicate across boundaries, and learn from each other

Secondary school students in Richland, South Carolina work on a collaborative writing project in Google Docs using their Chromebooks.

"Chromebooks open up the whole world to students. The collective knowledge of the entire human race is on their desks, and that is the best gift any teacher can give to a student."
—Peter Iles, Principal, Wisconsin USA (first school to use Chromebooks)

Devices for Learning on the Web

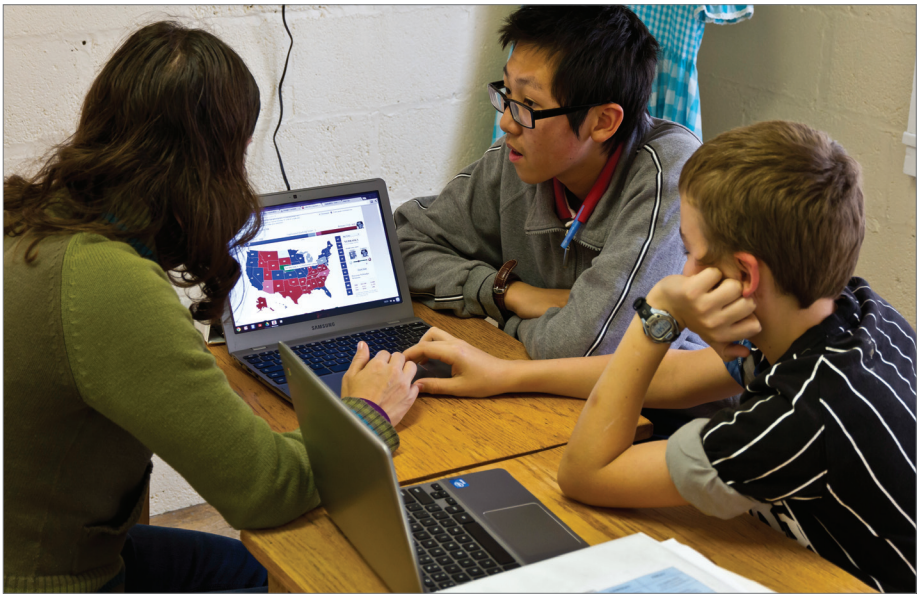
Many countries and regions want to use the web to help provide excellent education, regardless of their students' backgrounds. Some systems are examining one-to-one device programs, which provide one computer to each student. Whether there are 100 or 10,000 devices, it's essential that they be managed with minimal information technology (IT) overhead. More than **3,000** schools around the world have chosen the most affordable, manageable and scalable option: Chromebooks from Google.

Chromebooks are a new kind of computer, offering fast, simple, secure computing. Low-cost, yet very manageable, Chromebooks make it possible for schools, districts, states, and even entire countries to embrace the web and offer every student a device.

In one of the first nationwide initiatives of its kind, the Malaysian Ministry of Education selected **YTL** Communications for the 1BestariNet project. By the end of 2013, this project will provide all 10,000 schools with nationwide 4G mobile connectivity and with **Frog**, a web-based learning platform. More than 10 million students, teachers, and parents will access this platform, which includes **Google Apps for Education** for anytime, anywhere learning.

As part of this initiative, the Ministry is also deploying Chromebooks for teaching and learning to schools nationwide. For primary and secondary[1] students, Chromebooks will become integral tools for collaborative web-based learning and creativity.

The web is a key driver in creating equal opportunities. With its Education Blueprint, countries like Malaysia are bringing the web to all of their 5.5 million students to help close educational gaps and raise the achievement of every child in their system.



Secondary school students at North Country School, Lake Placid, New York, use Chromebooks to study simulated results of the 2012 US presidential election.

[1] Primary and secondary equates to kindergarten through 12th grade (K-12) in the United States.

"When other systems ask me what technology they should choose for moving to 1:1, I first say to them, 'What are you trying to achieve?" —Donna Teuber, Technology Integration Coordinator, South Carolina USA

"[This way of teaching means] engaging the quiet students in the back and allowing them to have a voice online. It's opening the doors of your 150-page textbook to the world, and connecting your subject to real things that matter." —Wendy Gorton, Educator, Laos

Key insights on large educational technology initiatives

School systems often share three common approaches to successfully deploying technology at scale:

1. Start with the vision, then determine the technology
2. Provide access to web-connected computers for every student and teacher
3. Plan deployments with scale in mind

This section details these three insights and offers glimpses of what educational leaders are implementing in their countries or states.

I. Start with the vision, then determine the technology

***Key Insight** – When considering technology, successful school systems first ask what educational goals they're trying to meet. It then becomes easier to choose the technology that best meets their needs.*

Malaysia started with goals, and engaged the country in shaping them. During the course of a year, more than 50,000 people participated in interviews, focus groups, surveys, town halls and roundtable discussions. Malaysia then sought solutions for its three technology needs – connectivity (via **YTL** telecommunication services), a learning platform (through **Frog Asia**), and access to computers (including Google Chromebooks) for all students.[2]

Once clear goals are established, school systems can then select technology solutions that will help them be successful. **Richland School District Two**, in Columbia, South Carolina, USA, for instance, surveyed teachers, students, and parents about what was important for learning. At **Leyden High School District 212**, outside Chicago, Illinois, USA, students and teachers carried various devices for a week, to determine which computers helped with most learning activities – and which didn't.

All three of these school systems found that Chromebooks – which leverage the tools of the web for learning – were the most appropriate devices for almost all at-school and at-home educational activities.

With their own Chromebooks, secondary school students at KIPP Academy of Opportunity in South Los Angeles use the web to study history and current events.

[2] Chapter 2 of Malaysia's **National Education Blueprint** details the vision and goals.

"You are no longer tied to paper and pencils. Instead, students have 24/7 global access to the classroom, so that learning can take place when they are ready, wherever they are."
—Jim Sill, Educator, California USA

"In Chromebooks, it seems like we have found a device that enhances productivity – because you don't really notice that it's there. Instead of being a magnificent in-your-face piece of technical kit, Chromebooks are instead magnificently faceless, allowing all the fantastic software available online to come to the fore."
—Steve Philp, Educator, England

II. Provide access to web-connected computers for every student and teacher

***Key Insight** – For the first time, web accessibility and affordable portable devices mean that entire school systems can provide students with fast, anytime access to educational materials.*

Computers were once stationary devices – disconnected equipment stored in computer labs, or (too frequently) sitting broken in the back of a classroom. Students had to go to the computers to use them. Today, with the web and laptops, students can learn anytime, anywhere, connecting with people and information in their communities or across the globe.

Students with their own laptops have a wider range of resources and choices for how they learn. On the web, teams of students can **collaborate remotely on group presentations or documents**, math learners can use the **Desmos graphing calculator** for free instead of buying expensive devices, and budding scientists can create videos to share their **experiments** with the world.

Curated content is easily accessible on demand. Students and teachers can use, share and modify resources from content-aggregation portals such as **OERCommons**, which license open educational resources (OERs) to the public. Web-based virtual learning platforms such as **Frog**, **Hapara**, and **Pearson OpenClass** help them collaborate and communicate with each other.

Students and educators often cite three aspects of Chromebooks that make them a preferred tool for 1:1 learning:

1. They're optimized for the web – Since they run on the web they are easy to manage, and Chrome's web-based operating system is designed for simplicity and security
2. They're fast – booting in seconds and resuming from sleep-mode instantly, so it's easy for students to transition swiftly from one class to another
3. They're affordable – starting at $199 in the US[3]

Chromebooks are great for learning beyond the classroom, too. Cloud storage is built-in, so users can access their own applications and data from anywhere in the world. More and more apps work seamlessly, even when they aren't connected to the Internet.

Even younger students like these girls in Richland, South Carolina can use Chromebooks to learn, share and work together.

[3] Prices in other countries may vary. Additional taxes may apply.

"When schools choose to embrace the cloud, they have made a conscious decision to empower learners as integral partners in a culture that values creativity, relevance, and independence."
—Rich Kiker, Educator, Pennsylvania USA

"The fact that we won't need to constantly update software is huge, let alone support and maintenance costs."
—Matthew Peskay, Director of Technology, California USA

III. Plan deployments with scale in mind

***Key Insight** – Giving every student web access requires a solution that can be deployed and centrally managed, affordably and scalably. It also takes a simple-to-use solution so that educators spend less time dealing with technology and more time educating students.*

Limited budget and IT support are two of the biggest challenges that schools face when implementing technology programs. IT teams need the ability to configure a computer system centrally, and to provide consistent learning tools and content that can be easily restored if computers are lost or damaged.

Deploying Chromebooks instead of traditional PCs reduces IT headaches and the total cost of ownership (TCO) by streamlining support and centralizing administration through a web-based **management console**. Administrators can create user groups, apply policies, track assets, and much more, all from the web. Plus, Google updates Chromebooks automatically and for free, so they always run the latest software and security updates without any manual steps.

Findings show that Chromebooks sharply reduced the need for additional IT staff labor. Google worked with research firm IDC on a sponsored white paper, "**Quantifying the Economic Value of Chromebooks for K-12 Education**," which based its findings on data from schools using Chromebooks. They found that Chromebooks required about 69 percent less labor to deploy, and 92 percent less labor to support – compared with desktop PCs, laptop PCs, or netbooks.

With Chromebooks, IT administrators get **zero-touch deployment**. They can set up and update all computers from a single browser screen. They don't have to manually install programs or manage security settings on each Chromebook.

By moving to Chromebooks, the IT overhead of traditional computing can be drastically reduced. Software and servers aren't prime considerations anymore. Instead, students and teachers focus on using the web's vast resources for research and on cloud-based tools for collaboration and creating content.

An invitation

The lessons from Malaysia and school systems around the world show that collaboration among committed leaders in both the public and private sectors is critical to success.

If you are a leader looking to drive change in education through technology on a national or regional scale, please **contact Google** (http://goo.gl/AXSAM) to start the conversation today.

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