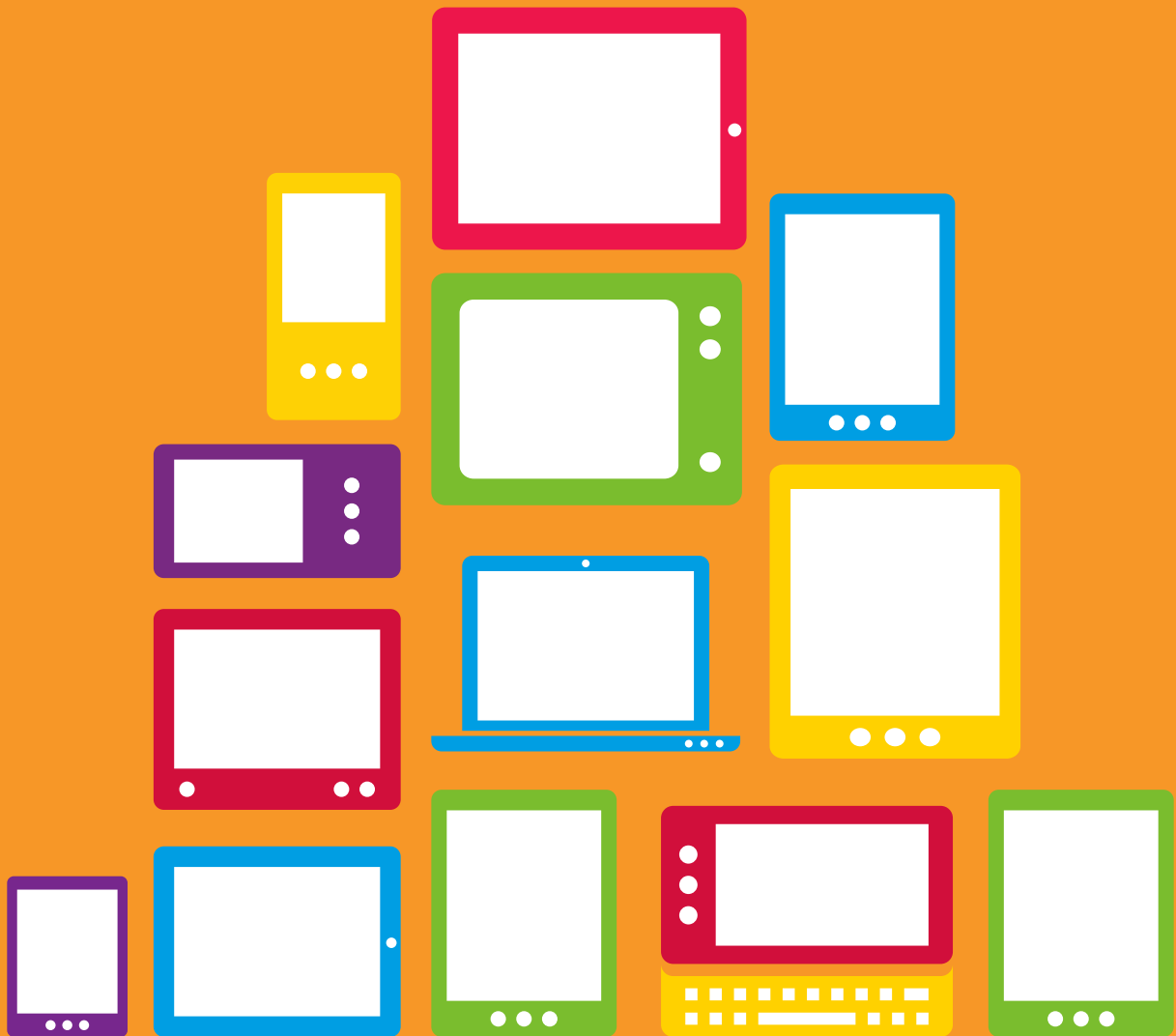




A HELPFUL GUIDE TO

Mobile Devices in the Classroom



mimio®

Introduction

As mobile devices become increasingly prevalent in our society, they are slowly but surely making inroads in our schools. While some schools continue to ban cell phones in the classroom, others are embracing them – as well as a myriad other mobile devices. This guide provides up-to-date statistics on the use of mobile devices in education, and the numbers may surprise you. For example, about 54% of K-12 schools currently implement mobile devices.¹

To help educators overcome some of the hurdles they face with mobile devices, this guide also provides a Quick Reference to the most popular types of mobile devices, and their individual pros and cons. You'll also find ideas on how to use these devices for collaboration and assessment in the classroom, and a list of popular applications and review sites.

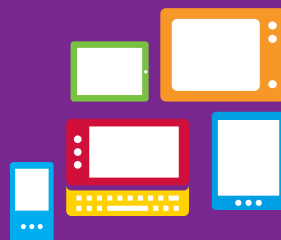
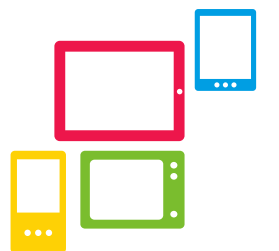


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The Challenges of Mobile Devices in the Classroom

Tablets and other mobile devices have been in schools for only about the past three years, so there are no truly well-established instructional practices for them. Most teachers are aware that the mobile movement has begun in K-12 education, but they are uncertain how to incorporate the devices in their classrooms.

Academics and researchers have begun to provide frameworks for thinking about how to use mobile devices for teaching and learning. Dr. Ruben Puentedura has developed the SMAR framework² as a guide to using technology devices in the classroom. SMAR is an acronym for four types of classroom applications: Substitution, Modification, Augmentation, and Redefinition.

- **Substitution Apps:** These applications allow you to do things on a mobile device that you can do with regular classroom tools – e.g., reading, creating flash cards, or practicing test facts and phonics.
- **Modification and Augmentation Apps:** These applications allow significant task redesign (modification) or functional improvement (augmentation) over normal classroom tools – e.g., an eBook that reads out loud, an encyclopedia that calculates equations, or a magazine that is built around specific interests.
- **Redefinition Apps:** These applications allow you to do things that were previously impossible without mobile devices – e.g., building collaborative narrated digital slideshows, or using apps to compare group work as a whole.

Redefinition is the area that provides the most excitement for both teachers and students. The technology isn't just letting teachers teach the same way with a different tool; it's actually bringing learning to a new level. For example, with the MimioMobile™ app on any combination of mobile devices,³ up to nine student devices can work simultaneously on a MimioStudio™ activity, with everyone's work displayed at the front of the classroom — encouraging collaboration. The app also lets students use their mobile devices for assessment via numeric, short-answer, and short-essay questions.

In the section of this guide titled “Redefining the Classroom: Exciting Ways to Use Mobile Devices,” you'll find some helpful ideas on how to incorporate mobile devices into your curriculum.

While the learning possibilities are exciting, the mobile device arena can be confusing. There is a plethora of devices now, and the technology is constantly changing. Determining how to make these devices available in the K-12 market further complicates matters for educators. There are new devices, updated devices, devices for just K-12, and BYOD (bring your own device) challenges. Educators require at least a general understanding of these possibilities before they can make the best, most informed decisions. The Quick Reference in this guide outlines the key types of mobile devices that are currently prevalent in the K-12 market, and lists their pros and cons.

There are other technology challenges faced by today's schools:

- **Security Issues** – the ability to control the privacy of student data when it is being managed via a cloud-based service.
- **Bandwidth Issues** – the ability to provide the amount of bandwidth necessary to allow all devices in a classroom or school to work simultaneously and seamlessly.
- **Setup and Management Issues** – the ability to handle the initial setup of devices and their apps in the classroom, as well as their ongoing management. As Technology/Curriculum Specialist Kathy Korty notes, “During the 2012-2013 school year, we lost 300 out of 1000 devices to breakage.”

These challenges may seem daunting, but new technology, learning systems, and applications are coming out constantly to make this transition go smoothly for schools, teachers, and students. For help going mobile, see the list of apps and review sites at the end of this guide.

“To understand their world, we must be willing to immerse ourselves in that world. We must embrace the new digital reality. If we can't relate, if we don't get it, we won't be able to make schools relevant to the current and future needs of the digital generation.”

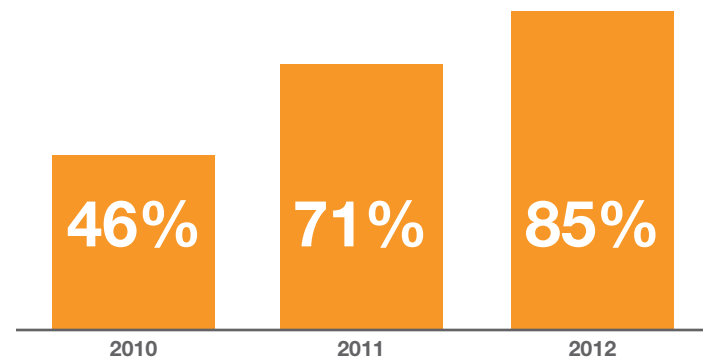
Ian Jukes
Founder & Executive Director
of the InfoSavvy Group

Education Is Going Mobile

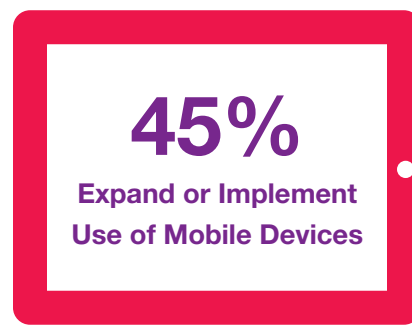
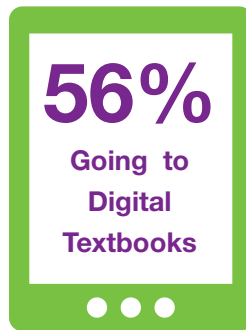
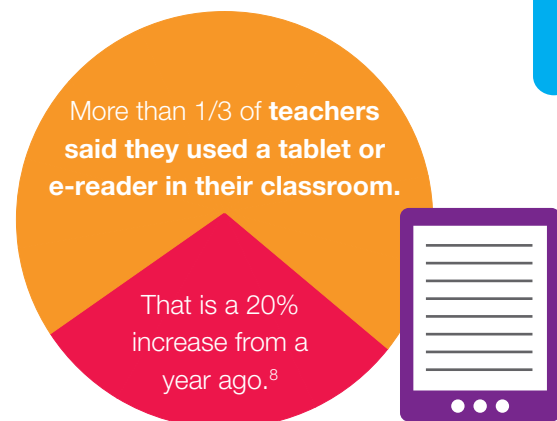
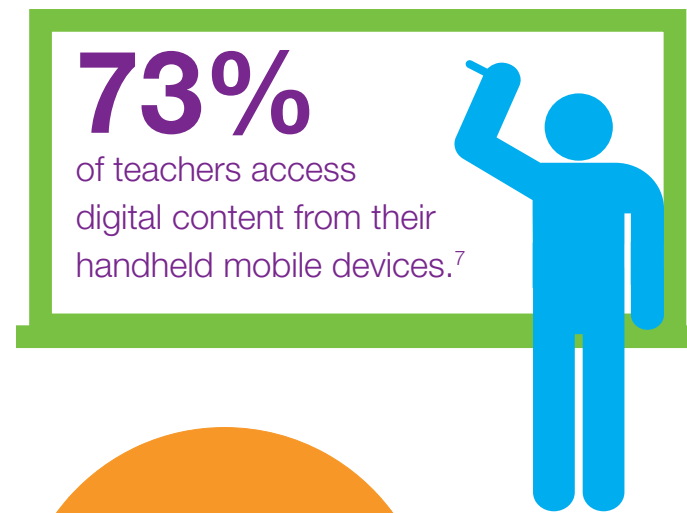


Classrooms Go Mobile

Percentage of District Technology Directors who indicated that wireless networks would be a high priority, 2010-2012:⁴

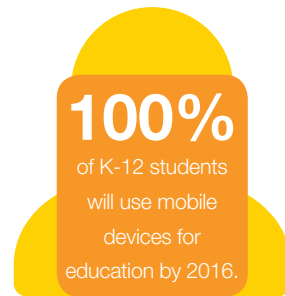


Teachers Go Mobile



56% of schools and libraries expect to implement or **expand digital textbook** use. 45% of schools and libraries plan to implement or **expand use of mobile devices**.⁵

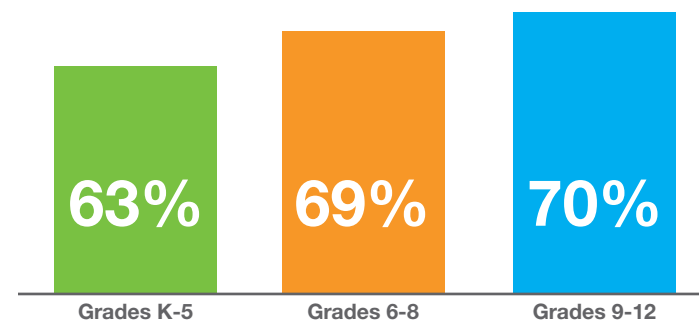
Students Go Mobile



Elliot Soloway, founder and CEO of GoKnow Mobile Learning Solutions, predicts that every K-12 student in America will be using a mobile handheld device as part of their education.⁶

Parents Go Mobile

Percentage of parents who are likely to buy a mobile device for their child to use at school:⁹



Mobile Benefits

A group of 4th graders **using handheld mobile devices in conjunction with their curriculum** increased reading skills by 2 years in 6 months.¹⁰



Increased Reading Skills by 2 Years in 6 Months



Percentage of teachers who note the benefits of technology:¹¹

74% Reinforces and expands content

74% Motivates students to learn

73% Students respond to the variety of learning methods

69% Able to do more with technology than without

65% Can demonstrate in ways they can't without technology

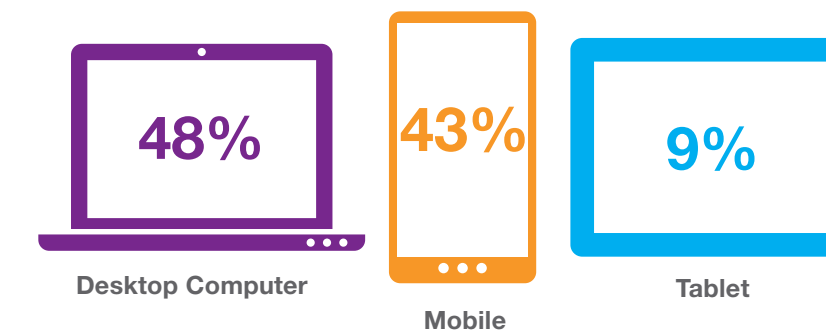
How Are We Going Mobile?



Mobile networks are accessible to more than 90% of the world's population.¹²

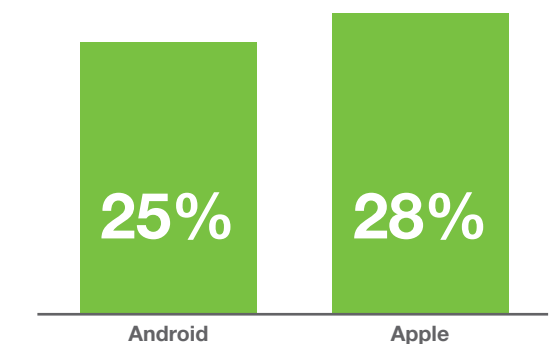
By 2017, **2 billion people** are expected to access the Internet via mobile devices.¹³

What devices are accessing the Internet?¹⁴



Apple or Android?

28% of cell owners own an Android; 25% own an iPhone.¹⁵



Mobile Device Quick Reference

This Quick Reference provides a snapshot of the different device types currently on the market, and offers some insight into the pros and cons of using these devices in the classroom.

The new MimioMobile™ application lets schools get the most from the mobile devices they already have by using them for truly collaborative learning and ongoing formative assessment. The MimioMobile app supports both Apple and Android tablets and phones.* Multiple mobile devices can be used together, along with MimioPad™ wireless pen tablets, MimioVote™ assessment handsets, and interactive whiteboards and devices from Mimio and other manufacturers.



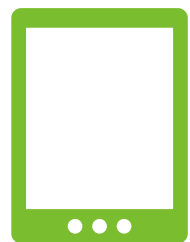
The Smartphone

What It Is: Smartphones are mobile phones that can run educational applications, record audio and video, and send email and text messages. Also in this category are “non-phone” smart devices (such as the iPod touch), which have all of the functionality of a smartphone minus phone and mobile broadband (data) capabilities.

Pros: Most students already own smartphones, so they are perfect for BYOD (bring your own device) classrooms.

Cons: For consuming media and material, the screen size can be limiting, and it is difficult to view any detailed content.

Popular Brands: iPhone, Samsung Galaxy, Motorola Moto X, HTC One, and LG Optimus



The E-book Reader

What It Is: E-book readers are primarily used for reading books, newspapers, and magazines. Some (but not all) e-readers offer Internet connectivity and other high-end functionality.

Pros: They are lighter than most tablets and are very comfortable to read, especially for longer periods of time or in the sunlight.

Cons: The functionality of some e-readers is limited to displaying reading material.

Popular Brands: Amazon's Kindle, the Sony Reader, Borders' Kobo, and Barnes and Noble's Nook

* MimioMobile works with iPad 2, iPad 3, iPad 4, iPad mini devices, iPhones (4th generation and above), iPod touch (4th Generation and above) and Android tablets 3.0 (Honeycomb) or higher

The Tablet

What It Is: Tablets are highly portable computing devices, with a larger screen than e-readers and smartphones. They are capable of doing any task that an e-reader or smartphone can do, but do not have the processing power of a laptop.

Pros: Tablets are small and light and can fit easily into a student's backpack. The screen size makes it easy to view class materials, take notes, and create content. By using your finger or a stylus, you can directly touch the screen, providing a more tactile experience than a mouse for drawing and illustrating.

Cons: Their functionality as a computing device is very limited. They are costly, and you must take special precautions in the care of the touchscreen display. While protective cases are available, they require a separate purchase.



Popular Brands: iPad, Google Nexus, Samsung Galaxy Note, Sony Xperia, and Microsoft Surface

The Chromebook (Thin Client Laptop)

What It Is: A Chromebook is an example of a “thin client laptop.” A Chromebook is a personal computer that runs Chrome OS as its operating system. Thin clients are designed to be used while connected to the Internet; they support applications that reside on the Web (such as Gmail, Google docs, etc.), rather than traditional applications that reside on the machine itself. All the data is stored in the “cloud,” and accessed by an Internet connection.

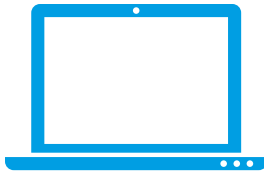
Pros: They cost a fraction of the price of a laptop, and have a full-sized keyboard to enter in notes in the classroom. They support many USB devices, such as cameras, mice, external keyboards, and flash drives.

Cons: They offer only a handful of applications that will work offline.



Popular Brands: Samsung Chromebook, Acer Chromebook, and HP Chromebook





The Laptop

What It Is: Laptops are portable PCs. They are larger and heavier than all of their mobile counterparts, but also much more powerful: they can run a desktop operating system.

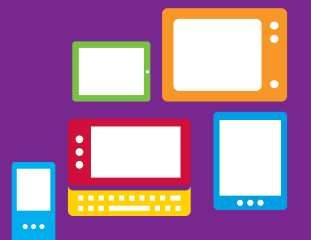
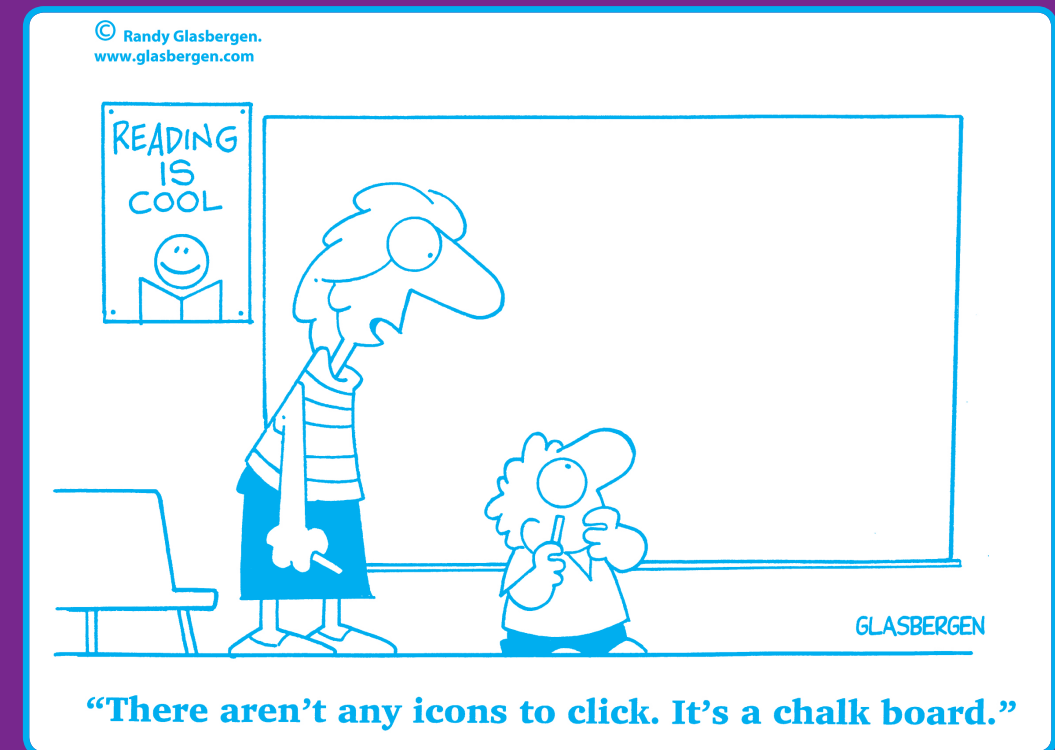
Laptops have a built-in keyboard and mouse (or track pad), and they work both online and offline.

Pros: Laptops can run all popular desktop applications, including Word, PowerPoint, and Excel, as well as mainstream games. Nothing is faster for creating content than a laptop used with a keyboard and mouse.

Cons: They are the largest and heaviest mobile devices, and they are costly.

As the numbers of mobile devices on the market grow, the devices are becoming more and more affordable for students and for your school. Using these devices in the classroom makes learning more engaging for students, and allows them to work today with the tools that will shape tomorrow. Add the MimioMobile app to the mix, and you can use those mobile devices for assessment and collaboration in the classroom – the app supports 97% of all Apple and Android devices currently on the market.

Popular Brands: Apple MacBook, Acer Aspire, Dell Latitude, Sony Vaio Pro, and Lenovo ThinkPad



Redefining the Classroom: Exciting Ways to Use Mobile Devices

Today's cross-curricular, collaborative approach to learning in Grades K-12 places emphasis on assessing understanding and knowledge, rather than on testing the mastery of facts. Group learning and student-centric approaches are increasingly the norm, replacing textbooks, lectures, and note-taking. Mobile devices can make this transition nearly effortless for both teachers and students.

Collaboration

Establishing a collaborative learning environment in classrooms is an important method of empowering students to live and thrive in the real world. Discussion, cooperation, open-mindedness, a variety of viewpoints, higher-order thinking skills, different curricular areas, disagreement, and debate are all elements that help students learn how to collaborate with others and thus become better educated individuals. Mobile devices are a key tool in creating a collaborative classroom.

Your school may have a limited number of mobile devices available, but many of today's students have their own smartphone. These devices can become learning tools with the addition of just one application, the MimioMobile app, which is free to all students in the classroom. For collaborative learning, it's not necessary to have a device for every student. Simply break the class into groups and provide each group with a MimioMobile-enabled device. Each group can then work collaboratively on a lesson or project sent to their device by the teacher. Their discussion will require them to agree or to compromise, and then come up with a joint solution that they can then present to the entire class. The app allows the teacher to give each group a turn taking control of the interactive whiteboard at the front of the room – and the teacher can also take back control at any time.

Mobile devices are allowing students to interact directly with the material being taught and work together in new and exciting ways. Teachers can help promote peer-to-peer learning, a key aspect of classroom collaboration, by paying careful attention to how they

group students. For example, they might put students who have a good grasp of the lesson content with others who are struggling. Or they might group students who are adept with the specific mobile device(s) being used with others who are less familiar with the technology. If students seem reluctant to collaborate in groups, the teacher could assign roles to one or more students in each group: one might be the “scribe,” who takes notes on the device, and another could be the “moderator,” who makes sure each student has a chance to speak.

Technology/Curriculum Specialist Kathy Korty finds that students love working with mobile devices. “Everyone agrees they are focused and engaged when they use the devices,” she says. “Our students and teachers are learning to implement more rigorous student activities and student projects. The new Collaborate feature of MimioMobile has been a real motivational tool for our teaching staff – they are so inspired by its capabilities.”

Mobile devices also give educators the flexibility to move throughout their classrooms – they're no longer tied to the front of the room. They can move about to see how students are doing in their small group/collaborative work, using the teacher device at the same time the students are doing their work.

Using mobile devices for collaboration increases engagement overall in the classroom and makes learning more effective. This is due at least in part to the fact that the learning is happening through a medium that students already know and understand. Today's students are fluent “digital natives.” Rather than force old school habits on these technology gurus, we can reach them better by “speaking their language.” Nine in ten of today's elementary, middle, and high school students believe that mobile devices will change the way students learn in the future (92%) and make learning more fun (90%).¹⁶ Mobile devices are changing how students learn, as well as helping them be better prepared for tomorrow's workplace.

“If we teach today
as we taught
yesterday, we
rob our children
of tomorrow.”

John Dewey
Educational Reformer

Assessment

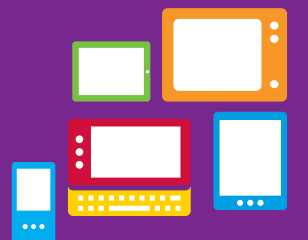
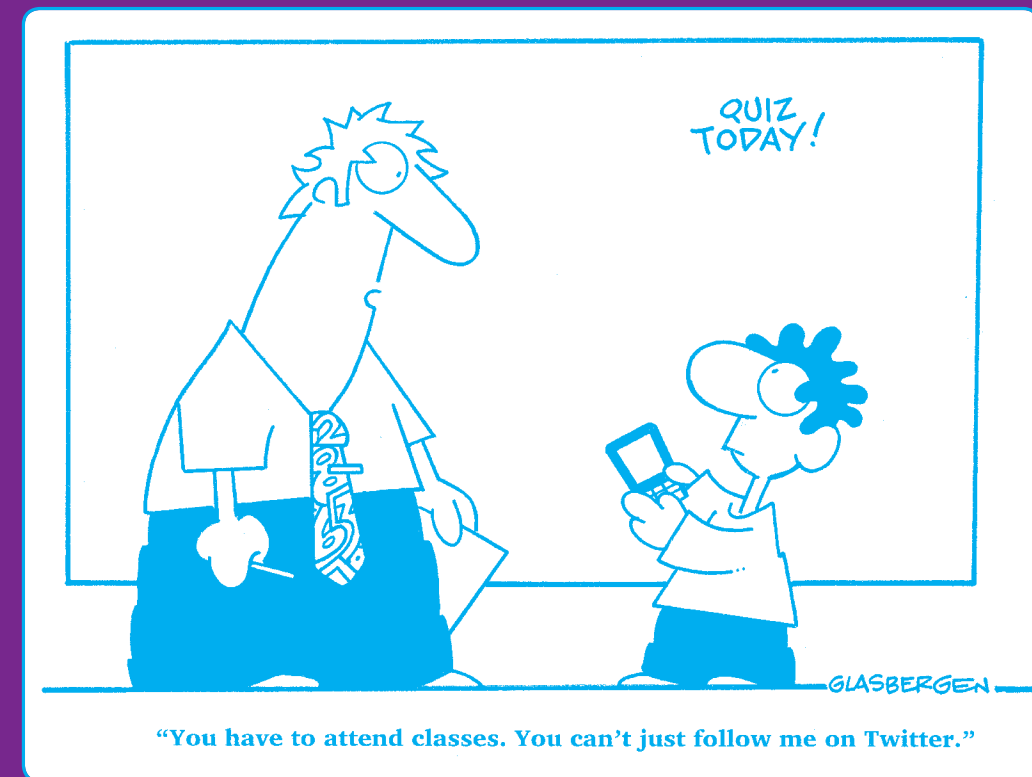
Mobile devices allow for much more accessible, real-time formative assessment in classrooms. Teachers can immediately assess how well their students are learning, and then adjust their teaching based on this feedback. While mobile devices are ideal for quickly checking student levels of understanding, they also streamline the management of smaller group assignments and instructional needs. Students who are shy about speaking aloud in class can text the teacher, for example, with their questions.

Mobile devices equipped with an application like the MimioMobile app allow teachers to employ different types of question options, which students can answer via their device. In addition to the usual multiple-choice and true/false questions, teachers can also ask students to submit short-answer and essay responses. This will help them develop skills for the new Common Core Assessments in 2014/15, which will include these types of open-ended response questions.

Mobile devices are a great way to increase engagement in classrooms by incorporating fun, dynamic quizzes, polls, and contests, which help to encourage collaboration, debate, and discussion.

The ability to “flip” formative assessment is another great use of mobile devices. Teachers can flip the usual classroom model by conducting quizzes via mobile devices as part of homework, and then use these results to determine planning for the following day/week of instruction. This model allows teachers to see where there are instructional gaps before they prepare the lessons, thus making their instructional reach and efficiency even greater.

Instructional Technology Specialist Lindy George notes that “District devices...allow us to monitor student understanding of concepts to better inform instruction, and for formative assessment they have replaced the purchase of any type of ‘clicker’ system.”



Resources Section

In this section you'll find some of the most popular educational apps on the market today. These apps perform a wide range of functions – from file storage to collaborating to providing image content for lessons. Apps for Android devices can be found at the Google Play store, which now has a special Education section. Apps for Apple devices can be downloaded from iTunes, and apps for Kindle devices can be downloaded from Amazon. All of these apps are designed to take your mobile devices to the next level.

Also listed in this section are a number of websites where you can find informative reviews of educational apps.

Popular Educational Apps

E-book Apps



Kindle – The Kindle app is available for every major smartphone, tablet, and computer. With the free Kindle reading app, you can buy a Kindle book once and read it on any device that has the Kindle app installed.



iBook – This free Apple e-book reader allows you to browse your library on a bookshelf, tap a book to open it, flip through pages with a swipe or a tap, and bookmark or add notes to your favorite passages.



Stanza – This e-book reader is well organized and easy to use, and makes reading on the iPhone as comfortable as possible on such a small screen.



Kobo – This free e-reader app syncs your library across all your devices – including iPad, iPhone, Android, Mac, PC, and all Kobo e-readers. Choose from multiple font sizes and styles; read in day mode or night mode.



Nook – This app gives you free and easy access to more than 3 million titles across the most popular devices. Sample books for free; try newsstand titles free for 14 days.



ShuBook – A versatile e-book reader designed for both beginning and expert users who are interested in keeping their own books forever readable – independent of any e-book website or e-book reader brand.

Collaboration Apps



Pinterest – This content sharing service allows members to “pin” images, videos, and other objects to their pinboard. Also includes standard social networking features. The following page provides ideas on how to use this site and app for education: pinterest.com/MBSDirect/reasons-to-use-pinterest-for-education/



MimioMobile – Allows classrooms using MimioStudio™ software to get the most from mobile devices by using them for collaborative learning and ongoing formative assessment. Every student with a mobile device can interact with the lesson displayed on the interactive whiteboard.

Capturing, Organizing, and Sharing Apps



Evernote – A suite of software programs and services designed to let you archive and share your notes, files, and images with friends, colleagues, and classmates. Makes it easy to collaborate and work together on projects.



Popplet – Lets you visualize ideas in a variety of ways. Useful as a collaborative brainstorming tool, as well as an effective presentation tool.



Diigo – This social bookmarking website and app allows you to bookmark and tag Web pages. Users can also highlight any part of a Web page and attach sticky notes to specific highlights or to a whole page.



Tumblr – This microblogging platform and social networking website allows users to post multimedia and other content to a short-form blog. Follow the blogs you are interested in and share the things you like with others.

Content Apps



Splashmath – A collection of fun and interactive math problems aligned to Common Core Standards. The app reinforces math concepts with self-paced and adaptive practice.



Google Scholar / Scholar Droid – A free app that lets you conveniently browse through search results returned by Google Scholar. A Web search engine that indexes the full text of scholarly literature across an array of publishing formats and disciplines.



Google Earth – A virtual globe, map, and geographical information program.



Anki – Lets you create friendly, intelligent flash cards.



Leafsnap – Allows you to identify any leaf simply by taking a picture of it. Leafsnap is the first in a series of electronic field guides that use visual recognition software.

Content Creation Apps



Google Docs – Allows users to create and edit documents online, while collaborating live with other users.



Animoto – Turns photos into professional-quality videos, complete with music and text. Choose photos, video clips, music, and video style. Users can easily share their creations.



Audio Boo – Allows users to post and share sound files (small audio snippets).

Storage Apps



Google Drive – Stores up to 15 GB of your data for free. Access your files from anywhere, and collaborate with others.



Drop Box – Bring your photos, docs, and videos to the Drop Box and share them easily.



Box – Access and edit your files, share content, and stay connected with your students or colleagues from anywhere, on any device.



Skydrive – Provides 7 GB of free cloud storage for your files. Access them from a Web browser or a local device.

Alerts, Reminders, and Communication Apps



Remind101 – This free app give teachers a safe way to send text messages to students and stay in touch with parents.



KikuText – This app is a service that makes it easy for teachers to communicate with parents using text messaging.



Celly – This app allows classmates and teachers to use social building blocks called “cells” for everyday collaboration, knowledge sharing, and group communication on any device.

Learning Management System Apps



Edmodo – Provides a safe and easy way for teachers and students to engage and collaborate for free – anytime, anywhere.



Schoology – This social network for K-12 schools and higher education institutions is focused on collaboration, allowing users to create, manage, and share academic content.

Online Resources for App Reviews and Information

Common Sense Media – Lists age-appropriate apps that you and your kids will love.
commonsensemedia.org/reviews?education_rating=learning_potential&media_type=30061

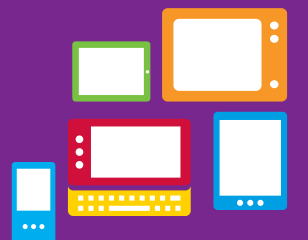
Best Educational Apps – Reviews high-quality learning apps for Apple and Android tablets and smartphones. These apps can be used by both children and adults for school and home use. besteducationalapps.com

Balefire Labs – Provides app reviews that are based on research and scientific criteria; apps are rated on effectiveness vs. opinion. balefirelabs.com

MindShift – Explores the future of learning in all its dimensions, covering cultural and technology trends, innovations in education, groundbreaking research, educational policy, and more. The site has a section dedicated to app reviews. blogs.kqed.org/mindshift/feature/educational-apps/

Langwitches Blog – Classifies popular iPad apps in relation to Bloom’s Taxonomy.
<http://langwitches.org/blog/2011/08/21/blooms-taxonomy-and-ipad-apps/>

Kathy Schrock’s Guide to Everything – Aligns apps for Apple, Android, and Google devices with Bloom’s Taxonomy, in easy-to-follow charts. schrockguide.net/bloomin-apps.html



Mobile Devices: Emerging Tools for 21st Century Learning

Schools nationwide are acknowledging that mobile devices – tablets, smartphones, e-book readers, and other devices – are emerging tools for 21st century learning. While there are some challenges to overcome in making the transition to instruction and assessment via mobile devices, there are clear advantages to integrating their use in the classroom.

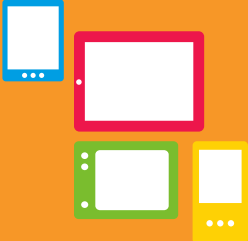
The flexibility of these devices supports any classroom setup and instructional approach. Teachers who understand their students' individual needs can align the use of these devices with their instructional approach, for optimal results. Mobile devices support “flipped classrooms,” where learning gaps are discovered before lessons are planned, so that those deficiencies can be addressed before student performance suffers.

Equally important, mobile devices facilitate the formative assessment process. Student understanding can be gauged and recorded in ways that engage the students and simplify the teacher's workload. And the ability to pose open-ended response questions allows teachers to help students develop the skills they will require for the new Common Core Assessments in 2014/15.

References

1. 2012 National Survey on Mobile Technology for K-12 Education Research Report, published by Interactive Educational Systems Design in collaboration with STEM Market Impact.
2. Puentedura, Ruben R. The SAMR Model: Six Exemplars. http://www.hippasus.com/rrpweblog/archives/2012/08/23/SAMR_BackgroundExemplars.pdf
3. Apple and Android tablets and phones, MimioPad™ wireless pen tablets, and MimioVote™ assessment.
4. Data from EdNET Insight, published in MDR's report, “The State of the K-12 Market 2012.” www.ednetinsight.com
5. http://edudemic.com/wp-content/uploads/2012/08/mobile-learning-report-card_5029176f1cc4b.jpg
6. Elliot Soloway, founder and CEO of GoKnow Mobile Learning Solutions. http://edudemic.com/wp-content/uploads/2012/08/mobile-learning-report-card_5029176f1cc4b.jpg
7. Tech Tenda: The Big Picture, MDR, A D&B company. www.schooldata.com
8. <http://upsidedown.edublogs.org/files/2013/02/Teachers-infograph-26bgp9y.jpg>
9. http://edudemic.com/wp-content/uploads/2012/08/leveraging-technology-for-k12-learning_5029186d9f6ca.jpg
10. <http://www.k12educationtechnology.com/wp-content/uploads/2012/06/Rise-of-Education-Technology-Infographic.pdf>
11. <http://upsidedown.edublogs.org/files/2013/02/Teachers-infograph-26bgp9y.jpg>
12. International Telecommunication Union (ITU) 2010 Report. <http://www.itu.int/pub/D-IND-WTDR-2010>
13. International Telecommunication Union (ITU) 2010 Report. <http://www.itu.int/pub/D-IND-WTDR-2010>
14. https://mixpanel.com/trends/#report/desktop_vs_mobile_vs_tablet, from the date Feb. 5, 2013 - Dec 10, 2013
15. <http://www.pewresearch.org/fact-tank/2013/06/29/as-it-turns-6-a-look-at-who-uses-the-iphone-no-not-everybody/>
16. Survey conducted for Pearson by Harris Interactive. http://www.pearsoned.com/new-study-reveals-u-s-students-believe-strongly-that-mobile-devices-will-improve-education/#.Unp7w5RgY_4. For more information, see www.harrisinteractive.com.

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