Tablet Computing

Time-to-Adoption Horizon: One Year or Less

In the past year, advances in tablet computers have captured the imagination of educators around the world. Led by the incredible success of the iPad, which in the fourth quarter of 2011 was selling at the rate of more than 3 million units a month, other similar devices such as the Samsung Galaxy and Sony’s Tablet S have also begun to enter this rapidly growing new market. In the process, tablets (a form that is distinct from tablet PCs) have come to be viewed as not just a new category of mobile devices, but indeed a new technology in its own right — one that blends features of laptops, smartphones, and earlier tablet computers with always-connected Internet, and thousands of apps with which to personalize the experience. As these new devices have become more used and understood, it is clear that they are independent and distinct from other mobile devices such as smartphones, e-readers, or tablet PCs. With significantly larger screens and richer gestured-based interfaces than their smartphone predecessors, they are ideal tools for sharing content, videos, images, and presentations because they are easy for anyone to use, visually compelling, and highly portable.

Overview

Led by the category-defining phenomenon that is the Apple iPad, tablets have earned their own listing in the NMC Horizon Report this year, completely distinct from mobiles. According to a recent study from comScore, the iPad now accounts for 97% of all tablet-based web traffic in the U.S. and 46.8% of all mobile web traffic. Similar statistics show tablets are increasingly the device of choice not just for web browsing, but also social networking and reading news. Competing models, including Motorola’s Xoom and Samsung’s Galaxy Tab have not yet enjoyed the success of the iPad, but together, these companies have solidified tablets as the new family of devices to watch.

Immensely portable, tablets are already a significant distribution element for magazines and e-books. iOS 5 even includes a newsstand that allows quick and easy access to newspapers and magazines and new subscriptions — with a mere touch. Even without extending their functionality via the full range of mobile apps, tablets serve as nicely sized video players with instant access to an enormous library of content; digital readers for books, magazines, and newspapers; real-time two-way video phones; easily sharable photo viewers and even cameras; fast, easy email and web browsers; and rich, full-featured game platforms — all in a slim, lightweight, portable package that fits in a purse or briefcase — but which significantly omits a traditional keyboard. That design choice, and the implications it brings for interacting with the device, is a key reason that tablets are not a new kind of lightweight laptop, but rather a completely new computing device.

When the iPad was introduced, it was described as a “lean back” experience as contrasted to the “lean forward” experience of typical computers. While second market and wireless keyboards are available for tablets, the real innovation in these devices is in how they are used. A swipe, a tap, or a pinch allows the user to interact with the device in completely new ways that are so intuitive and simple they require no manuals or instructions. The device itself encourages exploration of its capabilities, something easily demonstrated by simply placing the device in the hands of a small child. For times when a keyboard is needed, a custom-configured software keyboard appears, but the best-designed apps make little or no use of it.

Screen technology has advanced to the point that tablets are exceptionally effective at displaying visual content, such as photographs, books, and video; similar advances in gesture-based computing have moved
tablets far beyond the point and click capabilities of touchscreens, and tablets are engaging and intuitive devices to use. These combinations of features are especially enticing to educational institutions at all levels, and many K-12 institutions are considering tablets as a cost-effective alternative to the netbook when planning a one-to-one deployment. In these and other group settings, their large screens — and the ease with which the image automatically adjusts its orientation to the viewer — make it easy to share content.

Perhaps the most interesting aspect of tablets is that they owe their heritage not to the desktop, but to the mobile phone. Both iOS and Android-based tablets are designed with the app model firmly in mind, and hundreds of thousands of specialized apps are available to extend the functionality of tablets. Apps for tablets have many features in common with mobile apps, such as seamless use of location awareness, network connections, and other built-in sensors, but the larger screen real estate allows for more detailed interfaces or viewing area. Also similar to smartphone apps, apps for tablets are inexpensive and very easy to add to the device, using the same tools and online stores.

Relevance for Teaching, Learning, or Creative Inquiry

Because of their portability, large display, and touchscreen, tablets are ideal devices for one-to-one learning, as well as fieldwork. Many institutions are beginning to rely on them in place of cumbersome laboratory equipment, video equipment, and various other expensive tools that are not nearly as portable or as inexpensive to replace.

For example, the iPad has become an integral instrument in the cadaver laboratories at the University of California, Irvine. Images of body structures and radiographic films can be easily explored and manipulated on-screen, and apps such as “Epocrates Essentials” provide a mobile drug and disease reference at students’ fingertips (go.nmc.org/epeif). Similarly, Duke University has been exploring the use of the iPad as an efficient way to collect global health research (go.nmc.org/fqxpm).

More and more institutions are providing their students with iPad devices that come pre-loaded with course materials, digital textbooks, and other helpful resources. Under the Griffin Technology Advantage at Seton Hill University, for example, all full-time students receive an iPad 2. Similarly, the University of Southern Mississippi is piloting up to 1,000 Galaxy Tab 10.1 devices that will be issued to students, loaded with Blackboard Mobile™ Learn. Students and professors, sharing the same hardware and software, will experience and share audio, video, and other learning materials.

Because these types of tablet programs are relatively new, many universities and colleges are conducting in depth studies to measure their outcomes. Studies including those at Abilene Christian University, Oberlin College, the Missouri University of Science and Technology, and many others have generally found that integrating tablets into the curriculum has led to increased student engagement and has enhanced learning experiences. However, higher education institutions are just beginning to delve into more research surrounding some of the many potential uses of tablets, including the replacement of print textbooks with e-books, the wide use of specialized apps, the expanded use of the devices’ built-in sensors, GPS, gesture interface, cameras, video and audio tools, and more.

With their growing number of features, tablets give traction to other educational technologies — from facilitating the real-time data mining needed to support learning analytics to offering a plethora of game-based learning apps. What makes tablets so powerful is that students already use these or very similar devices outside the classroom to download apps, connect
to their social networks, and immerse themselves in informal learning experiences. As such, students are already quite comfortable using them in both academic and social settings.

A sampling of tablet computing applications across disciplines includes the following:

> **Chemistry.** In organic chemistry laboratories at the University of Illinois at Urbana-Champaign, wall-mounted iPads are equipped with a kiosk app to deliver video reviews of the lab techniques most needed by the students. Students also use the iPads throughout the chemistry courses to clarify experiment set-up and answer other procedural questions. [go.nmc.org/hjjvi](http://go.nmc.org/hjjvi)

> **Lecture Capture.** Tablet apps, such as McGraw Hill’s “Tegrity,” are used by the University of Colorado, Georgia Tech University, Fordham Law School, and many others as a campus-wide solution for recording and deploying class lectures. [go.nmc.org/zmgnp](http://go.nmc.org/zmgnp)

> **Mathematics.** As a collaborative project between the math support centers at three universities — Swinburne in Australia, Limerick in Ireland, and Loughborough in the UK — “MathsCasts” are videos of mathematical explanations recorded by writing on a tablet. They cover topics with which undergraduate students typically struggle. All “MathsCasts” carry a Creative Commons license and are available for free on the Swinburne website and on iTunes U. [go.nmc.org/igmlf](http://go.nmc.org/igmlf)

> **Writing.** Designed and developed by the University of Queensland, UQMarkup is an iPad app developed to facilitate the integration of contextualized audio and written feedback in student writing assessments. The feedback from the app is personalized, and the responses are provided in a short, fixed and easily understood format. [go.nmc.org/hwzcu](http://go.nmc.org/hwzcu)

**Tablet Computing in Practice**

The following links provide examples of tablet computing in use in higher education settings:

**iPad Makes Wall Street Debut**
[go.nmc.org/swnb](http://go.nmc.org/swnb)
During Drew University’s Wall Street Semester program, students will be equipped with an iPad and apps that access and interpret financial information. Conveniently, students can read course materials on their iPads instead of carrying books, and digitally compose documents, spreadsheets, and presentations.

**The iPad Replaces University Textbooks**
[go.nmc.org/vblpb](http://go.nmc.org/vblpb)
The University of Adelaide will replace textbooks with Apple iPads for first year students in its Science program. The University sees this as a way to allow the evolution of student learning environments to augment individual student growth.

**Solar-Powered iPad Devices**
[go.nmc.org/ctjzq](http://go.nmc.org/ctjzq)
In partnership with Apple, the Zimbabwe government is bringing solar-powered iPad devices to rural institutions across Africa that have not had consistent — or any — computer access in the past due to lack of electricity.

**University of Dayton Undergraduate Viewbook**
[go.nmc.org/wdcwm](http://go.nmc.org/wdcwm)
The free University of Dayton Viewbook app gives potential undergraduate students a virtual orientation to the school using video content, slideshows, and interactive feeds to explore academic facilities, programs, opportunities and student life.

**Valparaiso College of Engineering Releases iPad App**
[go.nmc.org/yqqhw](http://go.nmc.org/yqqhw)
Recent Valparaiso University graduates have developed a new interactive digital magazine for the iPad that incorporates videos and photo galleries into stories so that students, faculty, alumni and anyone interested can connect to news and happenings within the College of Engineering.

**For Further Reading**
The following articles and resources are recommended for those who wish to learn more about tablet computing:
6 Reasons Tablets are Ready for the Classroom

go.nmc.org/lcrin
(Vineet Madan, *Mashable*, 16 May 2011.) This article explores the applications of tablet computers in higher education, based on reports from classrooms that have participated in pilot studies, citing that iPads fit with students’ current lifestyles.

The B-School Case Study Gets a Digital Makeover

go.nmc.org/delwj
(Erin Zlomek, *Bloomberg Business Week*, 25 July 2011.) This article demonstrates how tablets allow students a convenient way to access and interact with the many business case studies that are a core part of business school curriculum.

Campus Tour Now Comes with an iPad

go.nmc.org/hszrt
(Jody S. Cohen, *Chicago Tribune*, 9 October 2011.) Bradley University is now distributing iPads during campus tours so that when prospective students are shown areas of the campus, they can also watch videos of events that have taken place there throughout the year. Seeing laboratories and lecture halls in use gives students an understanding of what busy campus life will be like, even when touring during holidays or summer months.

Educators Evaluate Learning Benefits of iPad

go.nmc.org/whlnr
(Ian Quillen, *Education Week*, 15 June 2011.) This article discusses the use of iPad devices as learning tools, and delves into the ongoing discourse about whether they are more viable for one-to-one solutions or as part of a group of shared devices.

An iPad University: Giving It the Old College Try

go.nmc.org/zxqiy
(Lena Groeger, *Wired*, 22 July 2011.) The University of Southern California has teamed up with TouchAppMedia and 2tor, Inc. to create an online distance learning experience fully accessible with an iPad or mobile device, featuring social integrations like video chat with classmates and sharing notes and ideas on course walls and forums.

Kindle Fire: Changing the Game in Higher Education?

go.nmc.org/hdoru
(Vineet Madan, *Geek Wire*, 15 November 2011.) This article measures the new Kindle Fire to its competitor, the iPad, citing that the smaller screen of the Kindle Fire is the main shortcoming of the device for educational purposes, since students are looking to use the device to read and access multimedia, such as images and videos.

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