iOS DEVICE BEST PRACTICES & TIPS

A WHITEPAPER

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Learning with Mobile Devices

Our History with Apple

Since 1997, Goochland County Public Schools (VA) has been exclusively using Apple hardware and software to support teaching and learning. With the advent in 2001 of the iPod, we immediately recognized the appeal of holding a small, mobile device in one's hand and began to explore the potential for transforming this entertainment device into a learning device. An early grant-funded pilot with iPods looked at using the click-wheel devices for foreign language instruction, social studies, as digital microphones, and as off-line repositories of content from Wikipedia.

Today Goochland deploys iMac and MacBook computers for student use in seven buildings and in SY 2010-11, piloted the use of iPod Touch in elementary classrooms (grades 1-5). Our current deployment supports a student-to-device ratio of 2:1. The iPod Touch pilot gave us valuable information about how the devices can support center-based instruction popular in early grade levels, and how the devices can support mastery of the Virginia SOL and also project-based approaches such as Goochland's own G21™ framework.

One of the early appeals of adopting Macintosh in our school division was Apple's advanced ease of use for teachers, their history in K-12 education (see their ACOT2 study) and most importantly, the platform's ease of management. With Mac OS X and Mac OS X Server products supporting the backbone of our infrastructure, there's an obvious synergy to be found when deploying and managing iOS devices in a school environment. This document will outline what we've accomplished instructionally so far using Apple mobile devices, with notes and details about management.

John Hendron

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Stay current by following our weblogs:

John Hendron	http://blogs.glnd.k12.va.us/teachers/jhendron/
Bea Cantor	http://blogs.glnd.k12.va.us/teachers/bcantor/

On Choosing Applications

One of the most-focused elements of the iOS platform is *apps*. We do not believe one magic app will cure instructional deficiencies with any one subject area. While there is a healthy, growing market of apps aimed at the educational arena, many support "drill and practice" type experiences for students. These can be valuable in developing basic skills. In mathematics, for instance, students can improve their numeracy and computation skills. Flashcard apps can help support vocabulary development. And an app like *Stack the States* can help develop familiarity with facts about the individual United States within the context of an appealing game. We do question, however, the value of this genre of application during the school day as the only type of experience students have with mobile computing.

Goochland County Public Schools has committed itself to twenty-first century teaching and learning using a student product-based framework called G21™ (http://www.glnd.k12.va.us/index/resource/g21). We therefore prefer the use of all computing devices that support the creation of content over drill and practice. Examples of apps in this category may include Apple's *Pages* word processor, Apple's *iMovie*, or Apple's *GarageBand*. These applications are by design cross-curricular and support the creation of student products.

Currently we take recommendations from all teachers on future app purchases. These are collected using a Google Form linked from John's weblog. These are reviewed throughout the year and in some cases, tested. We do consider a number of criteria, including: price, uniqueness, student appeal, instructional design, and integration with project-based learning.

Current Elementary Deployment

Goochland has three elementary schools. All schools have deployed 3 iPod Touch devices in each K-1 classroom to be used in a center-based approach. Teachers keep these devices and are responsible for charging them. Each elementary school has one thirty-iPad 2 cart. This cart is housed in the school's media center and is maintained by the school's media specialist. Two of our schools have one 20-iPod Touch Bretford case, and one school has the same Bretford case with one additional Bretford iPod Touch cart with 20 iPod Touch devices (the cart can technically hold 40 devices using both of its drawers).

Each device has been barcoded by the technology department and the devices have also been cataloged for inventory at the school by the media specialist. Each device has been issued with a cover, and has been etched with a unique serial number at the factory by Apple. This number is the same as our barcode numbers issued by GCPS.

Syncing cables have been deployed with the cases/carts to support the transfer of data between the iOS device and a MacBook computer.

Media specialists are the only persons in the school who have our iTunes account password. They may use it to update the apps on the device but they have not been charged with installing new apps.

Current Secondary Deployment

Goochland High School and Middle School currently are connected in a centralized secondary complex. The schools deploy each between 12-14 MacBook laptop carts at each school and are currently sharing one 30-iPad 2 cart. This cart is managed by Bea, who serves both schools as the ITRT. In addition, each school has deployed what we are call-

ing a "21st Century Classroom." The social studies classroom at GHS and the English classroom at GMS house both 15 MacBook laptop computers and 15 iPad 2 devices.

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Syncing cables have been deployed with the cases/carts to support the transfer of data between the iOS device and a MacBook computer.

Bea uses the iTunes account password to update apps. She is the only person in the secondary complex with this credential.

The Twenty-First Century Classroom Rationale

In exploring 21st century teaching and learning, we often run into issues of pedagogy, access to tools, physical room arrangements, and more. We provide all secondary students with Google Apps for Education accounts, Moodle accounts, and each classroom is outfitted with a Promethean Activboard and Activotes. But if we can improve issues of access and support collaborative learning, we'd be closer to what we feel is the best of a "21st century" learning approach.
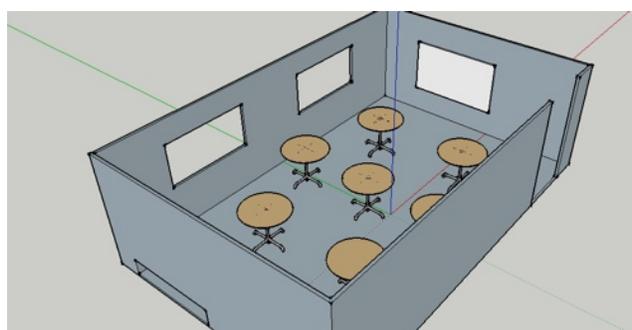
Our G21™ framework identifies twelve different 21st century skills, including small-group collaboration, communication, creativity, and research 2.0. The first step in creating a new learning environment was to remove traditional desks and chairs. Our high school classroom uses round tables while our middle school classroom uses rectangular tables. These student groups are used to facilitate discussions and collaborative work.

Another way to encourage collaboration was to provide each student their own device in the classroom but to make these devices different. There are some things the iPad does well, there are other things the MacBook does better. Teachers can use different pairings of students and devices to encourage collaborative work. An example might be that partners shoot video using the iPad, then edit the video together on the MacBook.

One of our current challenges is document sharing and retrieval. We are exploring the uses of Dropbox, WebDAV on our own servers, and Google Apps.

We plan to share more about this classroom approach in March, 2012 at the [EdTech conference in Petersburg, VA](#), organized by WCVE IdeaStations, Richmond.

Administrators

We also deploy iPhone and iPad devices to administrators. We have purchased apps for their use, such as FileMaker Go, for classroom observations. These devices will not be discussed going further; while centrally managed, administrators use their own iTunes accounts on these devices and apps purchased by the school division are "gifted."

Management

iTunes and the Volume Purchasing Program

When you purchase and deploy iOS devices, you have to accept the fact that the devices and infrastructure for them was not designed around school or enterprise use. They are *consumer* devices, for lack of a better word, and managing the devices and apps has centered around Apple's legacy jukebox software, iTunes. Apple's take on this has been to farm-out enterprise-type management to third parties. This current is an imperfect solution, and with the advent of iOS 5, our management strategy changed somewhat.

First, schools need to participate in the Volume Purchasing Program (VPP) at https://volume.itunes.apple.com/. This site becomes your "store" instead of the "app store" found on the device and through iTunes. Schools must purchase one app for each device. Volume purchasing discounts apply in some cases for purchased apps. If they are available, the discount will be 50% when 20 or more copies are purchased. What makes this program messy, in our opinion, is that free apps must be procured through the regular app store.

Purchasing apps through VPP can be done through vouchers. Schools or districts apply these vouchers to one iTunes account. We use one account just for accessing the VPP website. This is not the same account we use on the devices themselves. At this time, Goochland is using the same iTunes credential on all devices deployed for students.

When you purchase applications through the VPP, an Excel spreadsheet is generated by the website. This includes redemption codes and links for each copy of the app you have purchased. In small numbers, these links can be sent to end-users (such as administrators) for them to redeem apps. They can be redeemed to any iTunes account. They are essentially "gifted" to the recipient.

Instead, we use a two-pronged approach to deploy these apps.

Casper from JAMF Software

Casper Suite from JAMF is a server-based management solution for computers and mobile devices. Our technology coordinator evaluated many solutions and found this was the best fit for our needs and budget. This software is a web-based solution that runs on our own dedicated server. It's used

- to push authentication certificates to the iOS devices,

- to inventory iOS devices into groups (by school, classroom, or individual),

- to query which apps are installed on any one device,

- to catalog all free and purchased apps,

- to manage the Excel spreadsheets/codes from the VPP,

- to assign codes from purchased apps to individual devices,

- to remotely wipe devices that have been stolen.

> **At Least Three Apple IDs**
> - one for VPP login (master)
> - one for devices (allows downloads, updates via App store; not tied to money)
> - one for MobileMe (Find my iPhone)

In small numbers, VPP and Casper may be the two methods we use to take a brand-new iPad out of the box and deliver it to a teacher within a day. For larger deployments, like entire carts or an iPod Touch case, we also employ iTunes.

What's next is a step-by-step scenario on how we manage a new device.

1. Purchase iOS device(s). Order with engraving with barcode identifier number, if possible.

2. Turn on device, authenticate to our network using a passkey. Go to Casper URL to enroll the device into the Casper system.

3. Casper sends authentication certificates to the device and iOS management parameters to the device, controlling access to certain apps, music/movie ratings, etc. These profiles can be created with Apple's iPhone Configuration Utility and copied over to Casper. It also installs its own app called "Self Service."
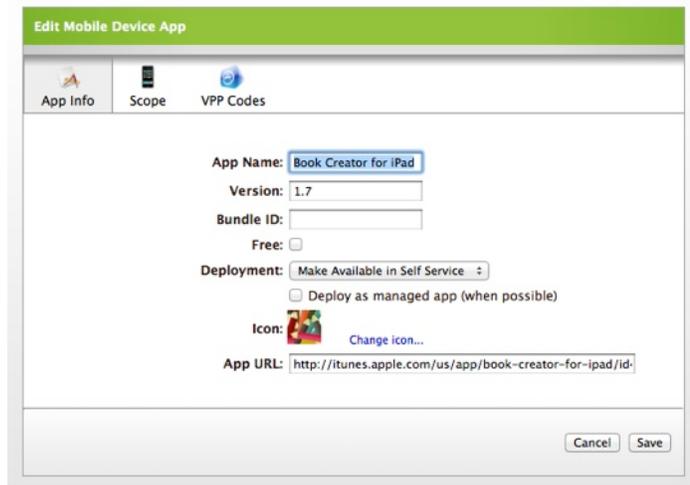
4. New apps are purchased through the VPP and spreadsheets are downloaded.

5. Within Casper, the new apps are either added to the catalog or the new purchase codes are added to already existing apps in the catalog.

6. A new group may be created (i.e., "GCPS Preschool iPads") for the ease of assigning apps.

7. Apps are assigned to the group. All devices in the group receive the invitation for redemption of the apps through Casper's "Self Service," now on the iOS device.

8. On each device, we launch "Self Service," tap on the app, and then we're taken to the app store. The first time around, we put in our iTunes credential. The app is then downloaded and installed. We can do this will already-deployed devices in the schools and media specialists/ITRT can redeem the apps.

9. For a large deployment, redeeming each app is tedious. So, we can also use iTunes to sync the new apps to the devices.

10. In iTunes, we redeem the app using one of the codes from the VPP spreadsheet.

11. We connect via USB the devices to the computer (up to 5-6 work well on Mac OS), or via WiFi. Once wifi has been established, it can be the preferred method for future syncing without using USB cords.

12. Select sync settings through iTunes (which photos, movies, apps, etc. do you want synced to this device). Sync.

This iTunes method does not redeem all the codes you have purchased—only the one on your copy of iTunes on the computer. This is okay by Apple, as long as you have purchased enough codes to cover all devices. It is much quicker to update devices this way when all are running iOS 5.

We ran into challenges getting iOS 4 devices to iOS 5 and used Apple's XCode Organizer development tool to facilitate the upgrade process. Xcode is only written for Mac OS X. iTunes on Mac or Windows may be used to update devices with apps.

After installing apps, you may want to tweak restrictions manually on each device. We currently do the following:

- In our profile using the iPhone Configuration tool, and pushed-out by Casper, we set up a dummy email account. This account blocks students from adding their own accounts to the device. We simply do not put in the correct credentials for the account, then prevent new accounts from being created.

- We set up a MobileMe account on each device with a separate Apple ID. This is for tracking the devices later if they become stolen.

- While it sounds good to limit movie/music to certain age groups, Casper will choke on these if set. Leave them "open" to all age groups.

- You can limit access to the iTunes store — this will prevent students from accessing music/movies.
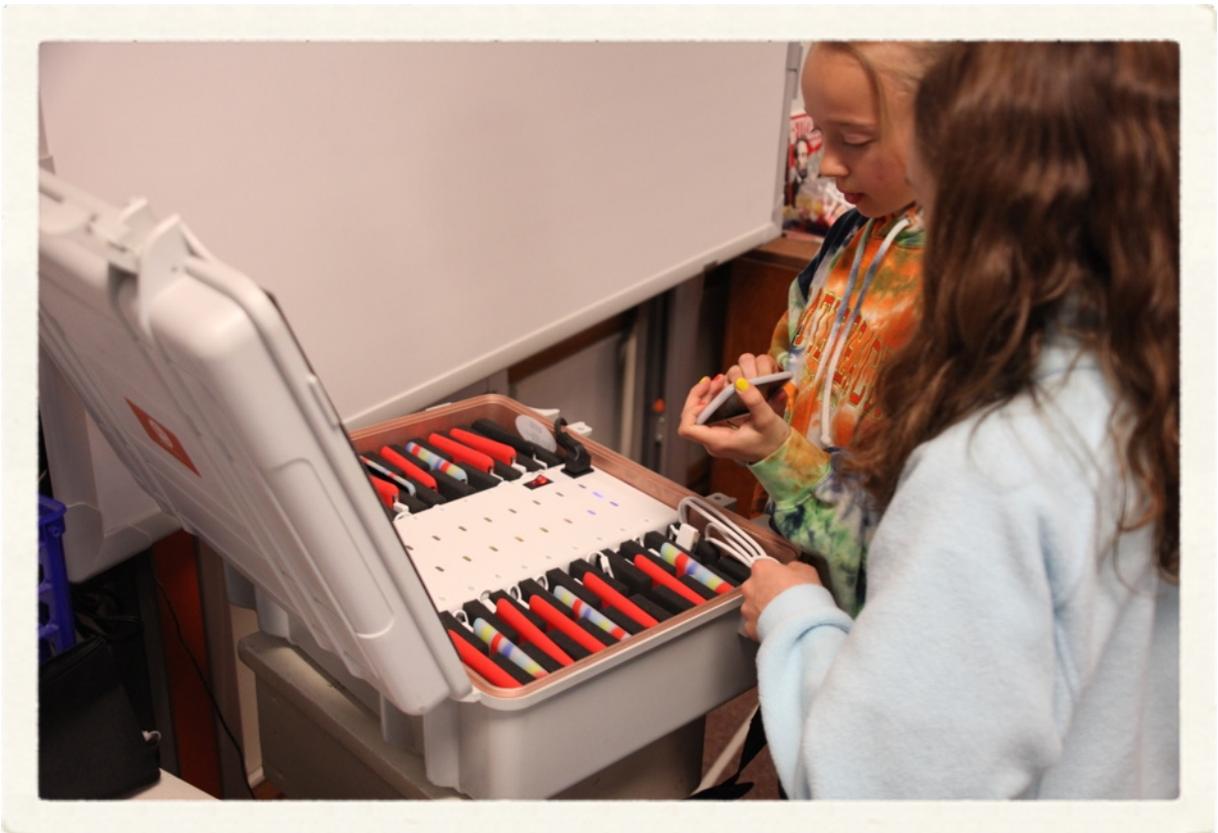
Lessons Learned

Apple's current lineup of touchscreen iOS devices are engaging for students to use. They work best in environments where every child has the opportunity to independently use them. While laptops lend themselves to sharing, iOS devices work best in a 1:1 scenario. Our future work with purchasing will be focused on our desire to provide even more personalized learning experiences where students can use a dedicated device throughout the day. Other schools today are exploring BYOD scenarios and "gifting" apps and textbooks as necessary.

iBooks is another area of interest to us. We have not yet purchased books for students on iOS devices. We are, however, interested in students being able to create their own eBooks in ePub format. With the advent of Apple's new iBooks Author tool using Mac OS X Lion, and the creation of an iTunes U for K-12 school districts, we're very excited about the future on the iOS platform for learning.

What follows are some general lessons learned through at least a year using iOS devices with students and administrators.

1. **Keep the devices charged.** Nothing's more deflating then a device that can't be used because no one plugged it in!

2. **Don't forget Safari!** If you're bummed you don't have the perfect app, don't forget you have the "whole Internet" on the device (minus Flash).

3. **Let students lead.** These devices do not require a lot of training for use with students—they are intuitive. You can find YouTube videos of babies and 90-year-old grandmothers alike using iPads. Let students lead with technical prowess and use these student leaders to assist others, as needed.

4. **QR codes** are a great way to get students to websites that have long URLs. Scan and go.

5. **Don't forget you have a great microphone, camera, and video camera in each device!** Get your media of photos/videos using iPhoto on the Mac.

6. **iCloud**—probably not a good idea unless you're in a 1:1 environment where each student is using their own Apple ID.

7. **Do spend time talking to students about your expectations for how to handle the devices.** Teachers should reinforce these teach time they are brought into the classroom (do not place them on the floor, place them on the center of your desk, use as a camera with two hands, etc.).

8. **Talk to the kids about the apps.** Find which ones they like the best. Ask them which ones help them learn. You'll find out a lot by asking these types of questions.

9. **Empower kids to answer their own questions.** With the device in reach, students can ask their own questions and get answers... use the power of inquiry to support instruction in every subject area.

10. **Don't forget the laptops.** For some things, the bigger computers still offer advantages. Learn how the two can create synergy (such as the publication of ePub books, use of iOS as camera or remote control, etc.).

11. **Share with teachers.** Our budget currently doesn't allow us to deploy devices for teachers too. So, we lend iPads to teachers from the student carts over the weekends.

12. **Offer professional development.** Our PD has focused on the pedagogy with the devices, favoring project-based approaches, over "apps."

Additional Information:

- [Gary on Apps](#)

- [Creating Video for Learning with iOS Devices](#) (Elementary Professional Development Workshop) and [Mobile Movies](#)

- [Virginia Society for Technology in Education SIG for Mobile Learning](#)

- [Supporting Education with Twenty-First Century Skills](#)

- [Keynote for iPad](#)

- [Comic Life on the iPad](#)

- [iOS in Education eBook](#) (Contains Goochland's list of apps for iOS Devices) and [PDF](#)

- [the iPads are Now Available](#) (promotional movie)

- [ePub Projects](#)

- [Watercolor iPaintings](#)

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