

iT3

iPad Deployment Summary and Recommendations

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Introduction

The iT3 Pilot was established by Eugene School District 4J to evaluate the use of iPads in an instructional environment.

A .5 FTE Technology Support Specialist position was added specifically to deploy iPads and support the ongoing instructional goals of the pilot.

School Preparations

An integral part of school preparations for a large number of personal devices is the setup and adherence to technology acceptable use agreements. These agreements are a set of standards for care of the equipment and student behavior governing the proper use of the equipment. Linking to behavior plans is also recommended.

Additionally, having teachers assign iPads to individual students whenever possible helps with accountability for devices. For laptops, we also have used a checkout sheet but in a “one device for each student” plan this was not required.

It is the goal of the pilot to eventually allow iPads to go home with students during weekdays. It is recommended that the students have a period of acclimation to the iPads and their proper use and treatment before sending them home. Additionally, the

Internet filtering is something that is handled at the school level and the district chose not to police student's home Internet usage.

Schools also need to be aware of the security and power requirements of the carts. 4J utilizes rooms in each school called "barns" which are extra secure areas.

Equipment

The district purchased over 700 iPads as part of the iT3 pilot. All participating teachers received iPad 2 or iPad 4 devices, which have a large screen and a 9.5" height. Most students in the pilot received iPad Mini devices, which have a smaller screen and 7.87" height. All elementary schools received iPad Minis. Madison Middle School received iPad 2 devices, a substantial number of which were used last year in the TRLT grant. The iPad 2 and iPad Mini have identical screen dimensions of 1024x768 pixels.

The district evaluated several carts to house the devices. Last year's TRLT grant utilized Bretford PowerSync carts (\$2,599) which have a capacity of 30 iPads. Upon recommendation of Canby School District, we evaluated Anthro 32 and 40 Tablet Charging Carts (\$904) as well as an Ergotron 48 Tablet Management Cart (\$2275 + shipping).

A major distinguishing factor in the selection of iPad carts is the ability to sync via USB. Specialized hardware is required to allow the sync of a large number of devices via USB, which contributes greatly to the cost of each individual cart. Synchronization, or "syncing" is the process of hooking up iPads to a central computer ("sync station") to perform backups of user data, install new applications, and update the devices' operating systems. This syncing process is not typically performed often, a factor which contributed to our favoring of one cart style over another.

For districtwide deployment, we settled on the Bretford PowerSync D20. This device is a 20-port powered USB hub that charges and syncs devices. This device does not come with USB-Lightning cables (required for the Mac Minis) which led us to require a purchase of many cables. After trying some inexpensive cables that literally disintegrated in student hands, we chose a cable manufactured by Greatshield that is still significantly cheaper than Apple's \$19 cable.

Deployment Methodology

There are several approaches for deploying iOS devices to schools. We chose a Layered method which keeps the devices in an Unsupervised mode. This still allows the devices to be connected to a teacher computer to copy photos. We locked the device down (to the extent currently possible) with a free MDM solution called Meraki and set up restriction codes.

We utilized two iTunes accounts per grade level, one for free apps and one for paid apps. This meant that when we made a VPP purchase of a paid app, we were actually only utilizing one redemption code. Not only does Apple require an age of 13 for an Apple ID, but the creation and management of this many Apple IDs would tax our already low manpower resources.

One critical setting we discovered in Restrictions is the Accounts setting, and to toggle to Don't Allow Changes. This effectively prevents students from switching to their personal iTunes account for messaging and app installation. With this set to Don't Allow Changes, we could safely keep Installing Apps set to On which is required to install apps during the sync process with the sync station.

Many school districts will no doubt choose to use a Supervised method of deployment instead. The main distinguishing feature of Supervised mode is that each iPad becomes associated with a specific instance of Configurator (Apple's batch deployment tool). Purchases of apps made with the Volume Purchase Program (VPP) are directly registered with corresponding devices. With this method, a redemption code becomes mapped to a device and can be reclaimed over time unless the device is lost or broken beyond recognition. A downside is that the device can only be synced and hooked up to a specific instance of Configurator, and cannot be hooked to teacher computers to transfer photos. Additionally, if the Configurator database is lost or corrupt, all of those redemption codes are lost unless backups are kept.

Deployment Timeline

The deployment of iPads occurred on the following dates:

Awbrey Park 4th Grade (90) : Deployed on 2/13

Awbrey Park 5th Grade (90): Deployed on 2/22

Spring Creek 4th/5th (120): Deployed on 3/4

Madison 6th (178): Deployed on 3/11

Sheldon Science (160): Deployed on 4/1

Monroe Science (80) : Deployed week of 4/8

Cal Young Science (40) : Deployed week of 4/15

The importance of a USB syncing hub at a district level (Bretford PowerSync D20) cannot be overstated. The use of this device for updating iOS and imaging multiple devices at once saved a tremendous amount of time.

Wireless

We went into the pilot assuming that we would be syncing over WiFi. This perspective changed drastically after a short time of real-world usage.

In a deployment containing many iPads, launching iTunes with WiFi syncing turned on resulted in an endless cycle of devices appearing and disappearing over time. This method of syncing lacked consistency to an extreme degree which made it impossible to do routine tasks like backing up or installing apps. Connection errors were commonplace.

We discovered that WiFi syncing takes 3 times as long as USB syncing. This loss of time, especially with the loss of several school technology personnel due to budget cuts, means that any way we can save time is critical. The use of USB hubs (specifically the Bretford PowerSync D20) is one way we will accomplish this.

4J's gated network requiring authentication also presented other challenges. We discovered that this authentication does not release when the iPads are put away, because the devices are not truly "off" when the lid is closed. We powered them down all the way, then discovered that when they are plugged into the charging cart they power back up and keep the authorization. We then adopted a procedure of turning the iPads off for at least 2 minutes after each class and not plugging them back in immediately, which is a hassle for classroom teachers.

Software

Software installed on iOS devices are known as "apps". Based on apps installed on iPads during the TRLT grant the previous year, the iT3 base image contained a set of free apps as well as a handful of paid apps.

The paid apps purchased for each school included a subset of the following apps: Comic Life, GarageBand, iMovie, Inspiration, Keynote, Numbers, and Pages. Not all schools received all of these apps if it was determined that they were of limited usefulness for their specific instructional goals. Late in the project, Awbrey Park and Madison received Book Creator.

An important consideration of app purchase is evaluation, or "vetting". From a district deployment standpoint, consistency is critical to efficiency and deviation from a standard plan leads to extra time creating a custom image for a school. In general, it was a better practice to install all the different apps used by schools that perform a specific function (like QR code reading or Clickers) rather than keep one app per school.

Additionally, as the iPads were used more and more by teachers and students, each school or set of teachers requested a number of different apps. We have no real way to guarantee that the knowledge we gained from using apps at one school will be shared with another school that has the same need. This results in lost time spent researching apps. Documenting which apps we are using in 4J is critical to the concept of knowledge sharing.

We did set up a FileMaker database to help keep track of apps purchased for specific schools, as well as to make notes on characteristics like the presence of advertisements.

Professional Development

Training for teachers and technology support staff is a critical element in the deployment of new technologies. 4J sponsored several workshops, both half day and full day, for teachers participating in the pilot. These workshops occurred approximately once a month.

We did find that reviews on the deployments were much less favorable when teachers in the pilot did not have iPads for their students. In the North region triad portion of the pilot, who received student iPads shortly after training began, reviews were in general much more favorable. In Sheldon region, many of the teachers did not yet have any experience with the iPads in a classroom setting. As a result, their training may not have been as relevant or valuable to them.

Teacher and administrative buy-in are critical to the success of the pilot.

iPad Integration

An important element of classroom integration for the teachers is the ability to display their iPad screens on a projector.

Initially, VGA adapters were purchased for this purpose but they are limited in that 1) the teacher needs to unplug their laptop and plug in the iPad and 2) the cable prevents the teacher from moving around the classroom.

A more efficient process is the use of Apple's Airplay protocol to display the iPad on a device already hooked up to a projector. This is accomplished through either an AppleTV (\$99) or via software on the Mac/PC called Reflector (\$11 each with a volume license). The hardware method via AppleTV did require custom setup on the network by Network Services, which resulted in time lost (sometimes months) without being able to use the device in the classroom. Reflector use was able to be accomplished by the teacher with minimal training and support in a few minutes.

Once set up with either AppleTV or Reflector, the teacher could freely move around the class and a custom rotating iPad case was purchased that allowed them optimal use of the iPad when typing.

Device Management

We believe that having devices inventoried is critical. When the iPads arrived they were promptly tagged with a 4J asset tag. We then scanned this number and the asset tag for our FileMaker Pro inventory database.

Assignments and deployment of devices were then associated with specific carts. For example, Cart A received iPads A01 thru A40. This information was added to the inventory database.

Due to limitations in Apple's iOS as well as their MDM API, we have no way to prevent students from "messing up" the iPads over time. They can freely move apps from folders. This forces the classroom teacher to teach the "Search" function rather than navigating to a specific folder.

It is hoped that future changes in iOS will allow MDM solutions to have more control over the appearance of the iPad screens so apps cannot be moved out of folders.

Security

Security of the devices is obviously a huge concern; an iPad can easily hide in a backpack and disappear off campus. For physical security, we used lockable Anthro carts that are wheeled into a secure "barn" room in each building for overnight storage.

For electronic tracking, we knew we wanted to use an Mobile Device Management Solution (MDM) and chose to use Meraki for the pilot because it was being offered for free and as such did not present a cost risk.

A major flaw in the security system of the iPads is the fact that profiles installed by MDMs such as Meraki and Casper can be easily deleted by students. Typically, two profiles are installed, a "Management" profile and a site-specific profile. While we could add a password requirement to remove the site profile, removing the Management profile did not need a password and caused both profiles to disappear, essentially eliminating the specific restrictions we had in place (except those covered by the built-in restrictions code). With Meraki, we turned on an email notification when this occurs.

Meraki can track the physical location of the devices but for more detail it requires an additional app download.

Problems

- Making reasonable attempts to save money is a legitimate concern in all areas of equipment purchase. Unfortunately, many “cheap” alternatives particularly in the area of cables had extremely high failure rates.
- Cases for the iPad Minis had limited room for a headphone jack. Several headphones would not connect correctly without altering the case or providing headphone extenders.
- During the initial phase of this pilot, we had approximately 4 iPads break out of 758. Three of these were due to accidental breakage, and one was due to a home button failure. Regarding the Mac minis, we discovered that Apple will repair a “single” crack for free but any more extensive cracks would not be covered. Additionally, highly specialized equipment is required to repair the Mac Mini screens and our in-house repair can not accommodate them.
- Teacher readiness to receive the devices and begin instruction did not entirely mesh with the dates they were deployed. In the case of Spring Creek, a week went by before they were ready to begin using the iPads in instruction. At Madison, several logistics involving student schedules needed to be worked out and they ultimately decided to distribute them before school in Commons hallways then receive them again at the end of the day after 6th period. At Sheldon, 3 of the 4 iPad carts were not utilized at all for an entire month.
- We needed to authenticate to our wireless in order to enroll in Meraki.

Ongoing Maintenance

Screens on the iPads are prone to fingerprints. These can be cleaned with a shammy cloth, but does require periodic attention to do so.

Outside covers on the iPad mini cases do also get dirty over time, and depending on the material the cover was constructed with, can be cleaned with a moist sponge or wipe.

The devices should be erased and re-imaged every year to remove student data and to reset to a cleaner state.

Ongoing Research Required

Development in the following areas will need to be closely followed.

eBooks - There has been high interest in Apple's iBooks platform for delivering electronic textbooks, primarily due to their interactive capabilities. We found that Apple expects each student to have their own Apple ID (not possible for elementary school students due to age restrictions) and many districts treat the purchase of these texts as consumables (something that is lost every year). We didn't find this an acceptable approach due to the long-term cost involved. Additionally, the DRM on iBooks limits their distribution to 10 devices so an Apple ID cannot be shared like we are doing for apps.

Alternatives to iBooks include Kno and Pearson, who are delivering books on a subscription model with preset accounts that the students can log in with. A downside is that these books do not have the same interactivity level that Apple's iBooks have.

Apple's API for MDM solutions - MDM solutions like Casper or Meraki are limited by the toolset offered by Apple. Each solution faces this problem, free or paid. Over time, changes to Apple's API will hopefully allow for greater control over devices.

Recommended Parts Lists and Vendors

A more up-to-date version of this list will be maintained at <http://blogs.4j.lane.edu/triad/purchasing> .

The following are the currently recommended equipment and parts associated with the iT3 Pilot.

Carts

Anthro 40 Tablet Charging Cart

\$906.90

<http://store.oetc.org/item/an-tab40ss-pw4>

Cases

iPad Mini

Ionic Rotating Stand Case

\$11.85

<http://www.amazon.com/Ionic-Rotating-Leather-built-Generation/dp/B0093REORQ>

iPad 2

Leather Case with Stand

\$7.00

<http://www.amazon.com/gp/product/B004T0EQP2>

Please note that this is an inexpensive case we recommend for students, not staff.

USB Hubs

(For use with district deployments)

Bretford PowerSync D20

\$1,149.95

<http://store.apple.com/us/product/H9759LL/A/bretford-powersync-d20>

(Classroom usage)

Plugable USB 2.0 Hub and BC 1.1 Fast Charger

\$19.95

<http://www.amazon.com/Plugable-Port-Charger-Power-Adapter/dp/B005P2BY5I>

****Important!** These hubs use a BC 1.1 Charging standard. They are certified to work on iPad Mini and iPad 4 for charging without being hooked up to a computer. We have tested them to work on an iPad 2 but are not guaranteed to do so. They do NOT work to charge an older iPod Touch due to the power draw over the USB port of those devices and only “trickle charge” them.

Cables

30-Pin USB Cables

OPSO Apple Authorized

\$9.99

<http://www.amazon.com/dp/B009N72TAA?psc=1>

Lightning Cables

GreatShield USB Cable

\$14.99

<http://www.amazon.com/GreatShield-Licensed-Lightning-Charge-iPhone/dp/B00C4YLC52/>