

INSTANT CLASSROOM: TEACH ANYWHERE WITH A CLASSROOM IN A BOX

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Imagine that you could break free and teach anywhere without compromising the quality of content of your instruction due to available technology or space. Completely equipped with a fully mobile classroom, you could pump up the interactivity and adaptability of your information literacy instruction, fully leveraging your ability to entice and teach students. The University of Virginia Library has done just that, creating a classroom in a box that liberates information literacy from the confines of physical space and fixed computing equipment. This paper will explore the motivation for creating the classroom in a box, including the equipment details, costs, and a summary of the experience teaching in this manner for a full academic year.

BACKGROUND

Traditionally, information literacy classes for freshman English Composition classes at the University of Virginia have been held in the library in a centrally located electronic classroom. Faculty members often prefer the library classroom to their own teaching spaces since it provides the students the opportunity to visit the library if they haven't previously and is equipped with desktop computers so that students do not have to bring their own laptops to the class. A significant portion of these one-shot instruction sessions is computer-based, giving students a first-hand opportunity to use their newly learned research skills to practice effective searching and source evaluation. Unfortunately, due to budgetary and space changes, our classroom no longer has the resources to fully meet our

instruction needs.

Availability and quality of computing equipment is both the lynchpin for our instruction and the biggest point of failure. Aging desktops and decreased funding to maintain and replace them have resulted in a smaller number of desktops (16) than our typical class size (18). In addition to the availability of functioning equipment, a greater number of university classes and students mean that the room has seen an increasingly packed schedule. Due to our reliance on one classroom, we are increasingly unable to schedule classes at ideal instruction points. Using the students' regular classroom or non-electronic meeting spaces requires students to use their own laptops, which poses other challenges detailed below.

DECISION POINT: USING LIBRARY-OWNED EQUIPMENT

We have taught a number of classes using only student-owned laptops and we have identified a several problems with this approach, which compromises the students' ability to gain valuable personal experience researching. Using library-owned equipment eliminates almost all of these issues.

Ownership: Not all students have laptops. Statistics nationally indicate that more than 87% of students own laptops (Dahlstrom, Grunwald & Vockley, 2011, p. 7) while at the University of Virginia at least 98% of students have a laptop (U.Va. First Year Student Computer Inventory, 2009). Despite this information, our experience is that at least one student in every class does not own a laptop.

Availability: Laptops and chargers are forgotten at home, batteries die, and there are a limited number of outlets in each classroom. In addition, some students choose not to carry a heavy laptop from class to class during the day.

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Faculty Resistance: In some classes, students are discouraged from bringing or using their own laptops and mobile devices. Instructors cite distraction as one of the main reasons for this approach. This trend is not limited to the University of Virginia. In fact, some faculty have gone so far as to ban the use of laptops and mobile devices in the classroom (Glenn, 2010).

Distraction: When using personal laptops, students were often observed multi-tasking in class, flipping from social networking sites to a database and then to a half-finished research paper via their email. While students believe they are successfully multi-tasking during a class session, they are actually too distracted to fully take in class content. David Glenn calls this “an illusion of competence” (2010, p. B6). Although this issue is not entirely eliminated with library-owned devices, we have noticed that it is greatly reduced.

Technology: We spent valuable class time resolving technical problems with different browsers, operating speeds and platforms. Software updates and viruses also caused slow-downs. In a 50-minute class period, we frequently had to compromise content for troubleshooting.

WHY BUILD A MOBILE CLASSROOM?

It’s a perfect combination: we need the flexibility to teach anywhere and students want to be engaged from the minute they walk in the door. Mobile classrooms are specifically mentioned in the 2011 ECAR National Study of Undergraduate Students and Information Technology. One student said, “I feel that a mobile/dynamic classroom would be more interesting than a static one” (Dahlstrom, Grunwald & Vockley, 2011, p. 29). In order to create the best teaching and learning space for students, we sought a solution that would give us the best of all worlds: a travelling classroom equipped with library-owned equipment that could be used in any available space and which students could use to practice research skills while limiting distraction. To that end, we developed the classroom in a box--a mobile cart to store, charge and sync a set of iPads and a traveling case to ensure that we could transport the tablets across campus. The following section will cover the equipment selection.

BUILDING A CLASSROOM IN A BOX

We first developed a list of functional requirements that any solution would need to meet.

Individual Devices:

- Light and sturdy hardware: Traveling through buildings and across campus will be frequent and will subject devices to vibration. Users can be clumsy or inattentive.
- Easy to use: Users should be able to operate device with minimal or no training. Automatic connection to the campus wireless network should be easy to set up and troubleshoot.
- Reliable software: Programs used should work every

time.

- Software security: Users should be unable to modify or add unauthorized programs to the device.
- Easy to update: New programs should be easy to add. Software updates shouldn’t take too much time. Registration of accounts and sign-in should be straightforward and quick.
- Individual Protection for devices: Screen and case protection needed. Users should feel comfortable holding, picking up, and putting down without feeling that they’ll damage the device.

Storage and Transportation:

- Storage, syncing, and charging: Devices should have a storage cabinet (ideally mobile) that allows recharging and syncing without removing devices.
- Physical Security: Portable case and storage unit should be lockable.
- Tough travel case: Transport could take place during inclement weather as well as across a variety of road and sidewalk materials.
- Portability: Total mobile classroom package should be light and easily moved through doorways, in elevators, along sidewalks, etc.

DECISION POINT: CHOOSING THE IPAD

Following the recommendation of the University Library’s Mobile Computing Group, we purchased 22 iPads for student use, 4 for instructor use, and a MacBook Pro laptop to manage software updates. They suggested the iPad 2, which met all of our requirements and was the latest version in 2011 when we created the classroom. All of the iPads access the Internet using Wi-Fi, but we included 3G capabilities for the instructor machines in the event they were used off-campus. The solid-state hard drives gave the iPads an additional sturdiness factor that allows transportation across campus with less danger of damage to moving parts. Standard laptops with solid-state hard drives are far more expensive than iPads and were not considered for this and other reasons.

The simplicity and careful design of the iPad interface allows students with no familiarity to pick up the tablet and begin using it within seconds with no instruction from us. We laid out a main screen with shortcuts to the Library homepage and Library tutorials and relegated all other app shortcuts to another screen. Students do explore the capabilities of the device, but the focus is on research and we’ve made sure that not much else is possible.

We also decided to keep the software installation to a minimum. Even though there are hundreds of thousands of apps in the Apple Store, we use an Internet browser to access

our catalog and article databases and no other applications. This allows everything taught to be replicated by the student later on his or her own machine. And because we're using a browser, a relatively simple type of program, we have virtually no issues with software glitches or bugs.

Set-up was easy and secure. Apple requires an account with a password in order to install even free application software on iPads. This meant that we controlled access to the software, avoiding mayhem due to casual or even malicious intent. The Apple operating systems have also historically been immune to many of the virus, spyware and other problems that often affect PCs. To ensure that the tablets last as long as possible, we covered the screens with an anti-glare film that also protects from scratches and surrounded the back of the device with a hard plastic case. We also added soft neoprene cases for extra padding.

Secure storage, simultaneous syncing, and charging were our next goal. We found a lockable storage cart designed specifically for iPads that allows us to charge and update the devices in the cart. Wired connections integrated in the structure make connections between the Mac laptop and iPads a simple operation and the devices charge and update through the same connector. The cart is plugged into a standard wall outlet. In addition, the cart has wheels that allow movement among the five classrooms in our library on three different floors.

Though the iPads are individually light, a stack of 18 is heavy and unwieldy. A lockable, cushioned, waterproof travel case was our next purchase. Pelican makes a series of cases specifically designed for transportation of sensitive hardware. We chose one that was just large enough to hold the required number of iPads, but also small enough to allow us to navigate easily through hallways and doors across campus.

Equipment	Specifications	Cost	Totals
Tablets (student version)	Apple iPad 2 16GB Wi-Fi	\$499 x 22	\$10978
Tablets (instructor version)	Apple iPad 2 16GB Wi-Fi+3G	\$629 x 4	\$2516
Laptop	Apple 13-inch MacBook Pro	\$1199	\$1199
Display adapter	Apple iPad to VGA	\$29 x 4	\$116
Screen protectors	iLuv Anti-Glare Protection Film	\$25 x 22	\$550
Hard cases	iFrogz iPad Backbone	\$30 x 22	\$660
Soft cases	Incase Neoprene Slip Sleeve	\$40 x 22	\$880
Travel case	Pelican 1510 Carry On Case	\$110	\$110
Storage/Charging Cart	Bretford Powersync	\$2599	\$2599
Cleaning cloth	Microfiber	\$10 x 2	\$20
		Total:	\$19628

LESSONS LEARNED

Although we are very satisfied with the equipment choices we made, we have identified a few areas to consider for the future.

Transportation: We've noticed some minor damage to the hard plastic cases. We attribute this to the rough surfaces on our campus. Even in the padded travel case, the iPads are rattled about on the way to other buildings. In addition, the combined weight of the tablets and case are still substantial. We may look for a travel case with softer wheels to reduce fatigue for both the technology and the teacher. There are also new protective cases on the market that would additionally cushion the tablets.

Displaying content: We would like students to be able to share the results of their research on a main classroom screen wirelessly. Unfortunately, current campus network restrictions do not allow this. With this capacity, we would be able to flexibly demonstrate individual searches to the class to fully contextualize questions and answers.

Loans: University faculty have requested permission to borrow some or all of the iPads for use in classes. We need to explore policies for loaning the devices as well as procedures for adding special apps that faculty might desire. The mobile classroom is so popular, we may need to add another set of devices!

Technological diversity: Although we don't require students to use our iPads, most do, even though they may have their own laptops available. The mix of devices means that there are still some differences in the classroom experience caused by multiple operating systems and a variety of Internet browsers. We want to maximize learning and minimize distractions, so we may revisit this topic.

CONCLUSION

The classroom in a box has enchanted students, faculty and library instructors alike. Students are delighted to see the iPads and engage with them the moment they enter the classroom. They tend to stay focused throughout the instruction session. Faculty are happy that the simple yet effective technology allows our sessions to begin quickly and progress without incident or distraction. We no longer have to spend valuable class time trouble-shooting and can instead focus fully on the content of our information literacy instruction. This universally positive feedback demonstrates that the library has hit upon a successful solution to the budgetary and space concerns that accompany traditional electronic classroom space, and that the classroom in a box has been an unqualified success.

REFERENCES

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