

The Reed College iPad Study
Summary of Faculty Evaluation Reports
April 2011

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In November 2010, twenty-one Reed College faculty members were given an allowance toward the purchase of an iPad (or another tablet device¹), with the goal of exploring the potential of tablet technology for their teaching. Participants in the faculty tablet program were asked to submit a brief account of their experiences by February 28, 2011. The following is a summary of the faculty reports that we received; it also incorporates observations from other faculty members who had been evaluating the iPad on their own.

Usefulness of the iPad for teaching

All of the faculty members who evaluated the iPad found it to be extremely helpful for class preparation. They used it as a portable repository for course texts and their own class notes, which they read, reread, and annotated on the device (usually in PDF format) rather than on computer screens or in printed form. The iPad's long battery life and small size enabled faculty to take it almost everywhere they went, allowing them to prepare for class as efficiently as possible, even while traveling. In a few cases, the iPad's user interface transformed in-class presentations, due to the ease of the touch controls for navigating through hyperlinked PDFs and the capability to quickly locate online materials and assemble them into a slideshow. Many of those who team-teach Humanities 110, a required course for all first-year students at Reed, found that the iPad was a convenient platform for taking notes on their colleagues' lectures, particularly when they were able to take advantage of the device's sound recording capabilities. The iPad also proved useful for paperless grading and markup of student assignments; several participants reported that the legibility and usefulness of their comments on student work improved considerably as a result of using the iPad's annotation tools.

In addition to its usefulness in preparing for class and responding to students' written work, the iPad proved to be extraordinarily well suited to use in classes that involved a great deal of movement by students and instructors, such as in science labs and dance studios. Faculty members who used the iPad in these settings reported that the device's portability and touch controls made it an ideal tool for students to access lab materials, view videos, run simulations, and perform calculations. For similar reasons, the iPad also made it extremely easy for instructors to project images and documents, mark them up in real time, and play music. In fact, the faculty members who used iPads in active classroom environments found them to be superior to laptop computers.

¹ Although faculty participants were free to purchase the tablet device of their choice, they all opted for iPads.

The iPad was also useful in more traditional classroom settings. Easy, unobtrusive access to assigned readings—including a wide range of freely available literary texts—and reference apps made it a useful supplement to class discussions. Several faculty members also enjoyed using the device to project slideshows and to display images that could be manipulated easily (by instructors or students) using intuitive pan and zoom controls. Some instructors also reported success using the iPad as a digital blackboard for handwritten notes. On the whole, the iPad was viewed positively as a tool for classroom use although many of the pilot participants felt that, in order to take full advantage of the device's capabilities, both students and faculty would need to use iPads in class. Here, too, the form factor of the iPad was viewed as an advantage for classroom dynamics, since the iPad does not create a physical barrier between seminar participants in the same way that students' laptop screens do.

Shortcomings of the iPad for teaching

Although the faculty who participated in the pilot were generally positive about the iPad as a teaching tool and felt that the device had tremendous potential, they noted several limitations that need to be overcome in order for it to be as useful in the classroom as a laptop or desktop computer. Perhaps the most noticeable shortcoming was the lack of universal support for projection of the first-generation iPad's screen. Fortunately, this defect has been fully addressed in the iPad 2. Several other issues, however, remain unresolved.

File management: The iPad's lack of a transparent underlying file system and the relative difficulty of transferring files from a computer to the device, and vice versa, were seen by many faculty members as obstacles to using the device efficiently. Several people used online storage solutions like *Dropbox* or *MobileMe* to remedy the file transfer issue, but others would have preferred to transfer files directly from their computers to the iPad, via something as simple as a USB connection. File transfer via the *iTunes* software on a computer was widely viewed as cumbersome and inadequate.

The absence of an accessible file system was particularly inconvenient for faculty members who are accustomed to using learning management systems, such as *Moodle*, to distribute documents and other materials to their students. The limitations of *Moodle*'s current file browser, combined with the iPad's lack of a file system, make it impossible for faculty to use the iPad to comment on student papers and then return them easily via *Moodle*.² Instead, faculty members were forced to either transfer marked-up papers to their computers to return them to students or use the iPad to send them to students as email attachments.

Input methods and content creation: Nearly everyone found the touch keyboard difficult to use for typing anything longer than a brief annotation or email message; a few participants found that physical keyboards improved their typing experience, but impeded their mobility. For free-form input, the faculty were somewhat disappointed with the lack of fine-grained control when they wrote or drew on the iPad screen with their fingers, particularly when doing real-time markup of documents in class. They experimented with a variety of third-party styli with mixed reactions;

² The newest release of Moodle, which Reed is evaluating for adoption in fall 2012, offers considerably more flexibility in file browsing and may eliminate this difficulty altogether; see http://docs.moodle.org/en/Manage_repositories.

while some participants found it easy to adapt to using a stylus to take notes or mark up student papers, others discovered that the relatively broad-tipped styli that are currently available afforded them even less control over their writing than they had when using a fingertip. Consequently, many faculty members expressed a desire for a more sensitive and responsive stylus to use with the iPad, and recent reports indicate that such tools may be under development.³

The difficulty of using the iPad as an input device clearly designates it, at least for the moment, as a supplement to, not a replacement for, a laptop or desktop computer. Word processing and presentation software packages are available for the iPad, but faculty members who tried these applications largely found that they lacked key features of their non-iPad counterparts.

Software availability: With very few exceptions, our study participants reported that iPad apps able to address the specific needs of their academic disciplines either had not yet been developed or were not of sufficient quality or sophistication to be useful for their courses. In some cases, high-quality apps already exist for pre-college education, but have not been extended in ways that would make them suitable for higher education. If colleges and universities are interested in exploiting the potential of the iPad as a multi-functional device, they may need to take the lead in developing discipline-specific apps to meet their needs; at least two study participants are currently working with iPad software developers to do this.

Another factor that hindered faculty efforts to use the iPad for discipline-specific material in class was Apple iOS's lack of support for Flash and Java. In particular, the image viewer used by Reed's digital image database relies on Flash, making it difficult to display images from Reed's collections on the iPad. The image database is heavily used in teaching, particularly in Humanities 110, so it will be important to find an alternative to the Flash-based interface to facilitate the study of these images on the iPad. The lack of Java support means that a number of widely used web-based applets, notably molecule viewers used in chemistry courses, are unavailable until iPad-compatible alternatives are developed.

Training and support: We had expected to consult with the study participants on app selection and answer questions as needed, but did not plan to provide a systematic introduction to the iPad. Several faculty members indicated that they would have appreciated such an introduction, as well as an overview of useful apps for basic tasks such as PDF viewing and markup, in order to make the most of their explorations of the iPad in the limited time available to them. The question of app selection is a particularly complex one, since there are not yet "standard" iPad apps for most tasks and the sheer number of possibilities in Apple's App Store makes browsing for apps daunting. It is also very difficult to evaluate iPad apps without purchasing them, since trial versions are as yet nonexistent; many faculty members were reluctant to invest the time and money needed to evaluate apps that might not turn out to be useful to them, and suggested that an online list of "recommended apps" would be helpful in this regard.

³ <http://bits.blogs.nytimes.com/2011/02/04/apple-patents-a-stylus-to-reach-students/>

General-purpose apps evaluated

Despite the obstacles mentioned above, the faculty members who participated in the pilot evaluated a large number of apps, grouped here by purpose.

PDF reading and annotation: Nearly all of the participants tried at least one PDF reading and annotation app. By far the most widely used were *GoodReader* and *Aji iAnnotate*; in many cases, a preference for one or the other seemed to come down to the choice between *GoodReader*'s use of standard iOS text selection and markup tools and *iAnnotate*'s use of its own tools and a slightly larger range of options. At the time of the pilot, *iAnnotate*'s support for synchronization with *Dropbox* and other sources was more complete than *GoodReader*'s, but *GoodReader* now supports full synchronization. Other apps tested were *neu.Annotate*, *Readdle Docs*, *PDF Highlighter*, and *PDF Reader Pro*.

Note-taking: Other than the pre-installed *Notes* application, the most widely used note-taking applications were *Penultimate* (designed primarily for freehand input) and *SoundNote* (primarily for typed notes, with the option of synchronized audio recording). Participants also used *Notes Plus*, *SimpleNote*, *Outliner*, and *DEVONthink To Go*. All of these apps were useful but none rose to the level of clear, all-around "winner."

Text editing and word processing: Although they generally expressed dissatisfaction with the process of composing documents on the iPad, participants evaluated a number of word-processing and text editing apps. The most widely used was Apple's *Pages*; *Office HD*, *Quickoffice*, *GoDocs*, *Edhita*, and *myTexts* were also mentioned. In general, reactions to these apps were similar to those for note-taking: useful but no all-purpose best-of-breed (yet).

E-book readers: Many participants were content to use Apple's *iBooks* as an e-book reader; for certain e-book formats, a different app, such as *Stanza*, *Kindle*, or *Bluefire Reader*, was needed. *SideBooks* differentiated itself by offering a variety of page-turning options but was otherwise rated less highly than other e-book reading apps. *Inkling*, an interactive platform for e-textbooks, was seen as a promising way to take advantage of the iPad's capabilities, particularly by faculty members who were planning to develop their own e-book content.

Presentation tools: Reactions to Apple's *Keynote* app varied widely; some faculty members preferred the iPad version of the software to the Mac OS application or *PowerPoint*, while others were irritated by its limitations, particularly when viewing presentations created on a computer in either *PowerPoint* or *Keynote*, since some presentation elements and formatting were lost in the transition. Other presentation and display tools evaluated included *Whiteboard HD*, *Air Display*, and *Air Sketch*. As mentioned above, the iPad 2 now provides universal projection and mirroring for all apps, thereby giving faculty members a wider range of options for in-class iPad use.

File management: The most popular file management solution adopted by the faculty participants was *Dropbox*; *FileApp Pro* and *SortShots* (specifically for managing digital photos) were also mentioned.

Alternative web browsers: Most participants made extensive use of the *Safari* web browser and found that it met their needs; some experimented with other browsers that offered additional features, such as *Expedition* (support for projection; no longer needed for the iPad 2), *Atomic Web* (tabbed browsing), and *iLunandscape* (tabbed browsing, with tabs positioned at the bottom of the screen).

Drawing: For simple drawings and diagrams, participants used *Adobe Ideas*, *ZenBrush*, and *Draw Free*. An art department faculty member evaluated several other drawing apps, mentioned below in the *Discipline-specific apps evaluated* section, for more specialized use in studio art classes.

Search, reference, calculations: Participants found a variety of search, reference, and calculation tools useful, including *Google for iPad*, *iDictionary*, several foreign-language dictionaries, *iTranslate*, *Soundhound*, *3D Brain*, *Convert Units*, *Units and Constants* (has more categories of units than *Convert Units*), *Wolfram Alpha*, *PCalc Lite*, and *powerOne FL* (the last two are RPN-entry calculators).

Discipline-specific apps evaluated

Art: For drawing, *Adobe Ideas* (specifically for vector drawing), *SketchBook Pro*, *Brushes* (which offers the ability to record and replay the drawing process), and *AutoCAD WS* (for viewing and editing CAD files). While these apps replicated the paper-and-pencil drawing process well, the faculty member found that they did not yet offer enough additional features to justify the cost of having students use iPads for drawing. His suggestions for future improvement of these apps included adding location-aware features, enabling collaborative drawing, and (beginning with the iPad 2) including the built-in camera in the drawing process.

For programming in digital media courses, the *Processing.js*, *Xcode + Interface Builder*, and *iProcessing* environments were investigated; *iProcessing* seemed most promising for use in studio art courses and will be examined further.

Biology: Molecules to display, rotate, and twist molecular models in molecular biology and genetics courses. Although this app did not meet the needs of chemistry faculty (see below), it seemed to work well in this context. The iPad was also used extensively in genetics lab courses to show 3D animations of molecular processes that had been discussed in lecture.

Chemistry: Molecules, The Elements. *Molecules* was unacceptable for the needs of the chemistry faculty, due to its lack of flexibility in displaying molecular structures. *The Elements* was extremely useful as a reference tool, but because it did not support projection in fall 2010, it was difficult to use in the classroom.

Dance: MovingSpace: The Laban Scales. This app provided very useful visualizations of Laban Movement Analysis, but since it did not support projection in 2010, its use in the classroom was limited; the dance faculty member thought it would also be useful outside of class, for students equipped with iPads. This faculty member is coordinating a software development project to

create an iPad app for teaching dance using Labanotation. A beta version of the app will be tested at Reed and other colleges during summer 2011.

Mathematics/computer science: This exploration was primarily focused on the *ObjectiveC* programming language and *InterfaceBuilder*, with the goal of finding out whether iPad programming would be a viable topic for an introductory computer science course. Preliminary results were promising enough that the faculty member involved is seriously considering a unit on *ObjectiveC* for the course next year.

Physics: *Wolfram Alpha* was an extremely useful reference tool for laboratory work; *iCircuit* was used in the laboratory to simulate electronic circuits, and would help students to debug and understand the circuits if the iPad were pre-loaded with the appropriate circuits.

Psychology: *DSM-IV Mobile Desk Reference*, *iCBT*, *PsychLite*. *iCBT*, a Cognitive Behavioral Therapy tool, was the basis for a class assignment in which students were asked to design (but not build) an app with a similar purpose.

Russian: Several language-learning apps were evaluated, but none appeared to be of sufficient quality to use in college Russian teaching. *Lingvo Dictionaries* was a useful reference tool for students, and the availability of numerous Russian-language media apps provided easy access to authentic cultural materials.

Looking ahead

Because of the largely positive reactions of the participants in this first round of iPad evaluations and the growing interest in tablet technology on the part of both faculty and students, Reed will continue its investigation of the curricular potential of the iPad with a new group of twenty-one faculty members beginning in June 2011. Since this group will be using the iPad 2, it will be particularly interesting to see how the device's new features (universal support for projection, cameras, etc.) affect its usefulness in the classroom. Participants will be asked to submit their reports in October 2011, and we will release a summary of their findings shortly thereafter.