

Teaching with the iPad

Jamie Althoff, OD

Dr. Althoff is an Assistant Professor at Nova Southeastern University College of Optometry.

The use of iPads in education has been a popular topic of conversation since the release of the first iPad in 2010. Most of the discussion centers around the benefits of having students use iPads. However, after spending almost two years using an iPad to enhance my teaching, I am convinced that this device can be just as beneficial for the learning process when it is in the teacher's hands.

The thought of using a new and unfamiliar device may not appeal to those of us who are already teaching successfully with more comfortable, tried-and-true methods. However, if you are willing to invest a small amount of time, you will begin to see that there are many ways that using an iPad for your teaching can allow you to work efficiently, teach effectively, and have fun doing it.

I currently teach Theoretical Optics I and II lectures and laboratories for first-year optometry students at Nova Southeastern University. I began using an iPad in May 2012, and now I cannot imagine trying to teach my classes without it. I have used it in many different ways, and I have learned a lot in the process. I hope that sharing my experiences sparks new ideas for others and helps to shorten the learning curve for those who are new to the iPad. All applications discussed are available through the Apple App Store on the iPad.

Before Class

The iPad started working as a teaching

tool for me before the semester even started. Optics, along with many other topics covered in optometry school, is not a subject that can be adequately understood by only attending scheduled lectures. Some concepts require additional time for the students to digest and work through at their own pace. I used the iPad to create 5- 10-minute "tutorial videos" that the students are required to watch before the related lecture. They watch the video online and take a brief online quiz before arriving at class to demonstrate that they understand the basic concept. I love that when I start talking about a new topic in class, I see heads nodding in familiarity around the room. The students love that they can refer to these videos any time outside of class while they study.

I have used two apps to create these videos. One is ShowMe (free), which is simple and easy to learn. The iPad screen becomes a whiteboard that records your voice as you write and draw. Pictures can be added and annotated, and you can set up slides and navigate between them. When a video is finished, it is available, either publicly or privately, on the showme.com website. The video can also be downloaded to a computer, and this file (.mp4) can be uploaded to YouTube or a course management system such as Blackboard. One potentially major limitation to this app is the lack of any editing tool. I eventually learned to plan on creating each video at least twice because any small mistake means starting from scratch. An example of a tutorial vid-

eo made with this app is "Locating an Image With Ray Tracing." This is one of the longer yet more popular videos that I have made, and it is available on YouTube at <http://youtu.be/jeN-LOKqGaew>.

For several months, I used a different app, Explain Everything (\$2.99), for creating videos. It also records your voice and writing on the iPad and incorporates the use of photos and slides. It also allows you to add video clips and record your annotations as the video clip is playing, or to open a web browser and record as you navigate through a web page. Explain Everything has several additional features, but its main advantage is the ability to perform basic editing. You have the option of backing up and restarting the recording from the location that you select. Clearly, this can save a lot of prep time. However, with more options and features comes a steeper learning curve, and, unfortunately, I have noticed several bugs that show up when some of the more advanced features are being used. After several months, I decided that for my uses, the simplicity of ShowMe outweighed the features of Explain Everything. "Snell's Law and Lateral Displacement" is a tutorial video that I made with Explain Everything for students to view prior to lab, and it is available at <http://youtu.be/V-VtEA6yxZw>.

During Class

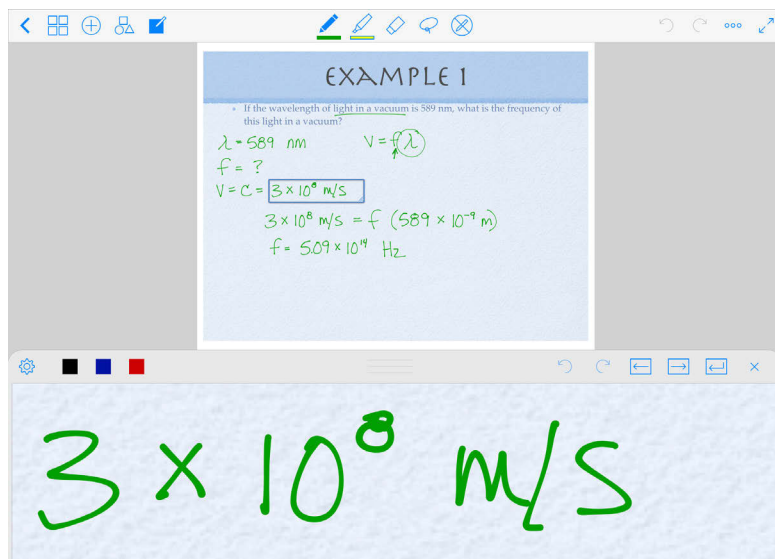
One of the main reasons I love to teach with my iPad is that I can annotate my slides while lecturing. I have not found

a way to make clear, detailed annotations directly with PowerPoint or Keynote, so the main caveat is that your lecture slides must be saved as a .pdf. This takes only seconds to do, but any animations or other interactive material within the presentation will not transfer to the .pdf format. Depending on the nature of your presentation, this could mean that a few minor changes or sacrifices are made, or it could mean that you are unable to use this method of presenting.

Once my lecture slides are saved as a .pdf, I e-mail this file to myself and open it in an annotation app on the iPad. (Most annotation apps will also link directly to cloud storage services such as Dropbox and Google Drive.) The iPad is connected to the projector via a VGA (\$29, apple.com) or HDMI cable (\$39, apple.com), or wirelessly with AppleTV (\$99, apple.com). Then, I can choose a color and pen size and start drawing. I can highlight, underline and circle text or figures on my slides. I can correct errors and write out key terms that are not included on the slide. For optics, the biggest advantage is that I can work through problems step by step along with the students and quickly sketch diagrams when questions come up. (Yes, this is similar to an overhead projector, but with many added benefits.) Side note: I provide a similar .pdf file to my students, and they also use an annotation app to take notes during class.

Several popular annotation apps are available. I currently prefer GoodNotes (\$4.99) for several reasons. GoodNotes will open many file types, although it essentially converts the file into a .pdf upon opening it, which may alter the appearance of non-.pdf files. You can also start a new file with a blank page, lined paper or graph paper. These files are stored within the app and can easily be sorted into folders. While you have a file open, it is easy to open a thumbnail view and scroll through all of your slides quickly. It is easy to add an image from the iPad into any document, and it is also easy to add a page in the middle of a document, for example, if you need more space to illustrate a concept. You also might find it useful to select an area of annotations and be able to move the selection to a different area on

Figure 1
GoodNotes utilizes a zoom window, where it is possible to write quickly and naturally. When presenting, only the slide projects. The zoom window and toolbar are not visible to the audience.



the screen, or even resize it. If you want to zoom in on a portion of your slide, it is easy to do by using the pinch gesture on the iPad. In addition, a shape detector creates perfectly straight lines and geometric shapes when you draw. GoodNotes also incorporates a zoom tool, which allows you to write within a zoomed-in box, but still view the entire slide while you're writing. (Figure 1) This allows for much more natural and legible handwriting. When using the app to present, only the slide and your annotations will project. The toolbar, zoom box, and other elements of the interface will not be visible to the students.

I have briefly used several other annotation apps. Notability (\$2.99) is very similar to GoodNotes, but the thumbnail view shows fewer slides at a time, making scrolling through long documents more cumbersome. Also, the shape detector is not as user-friendly. UPAD (\$4.99) is also similar, although I stopped using this app after only a few weeks because it tended to lag when I was working with longer .pdf documents, and the thumbnail view is only single-file, similar to Notability. PDF Expert (\$9.99) is another popular annotation app with a good reputation. However, I have not used PDF Expert because it is missing the ability to create a new document within the app, which is a feature I use frequently.

After Class

We all have students who, no matter how long we give them, want more time to complete their notes on a particular slide before moving on to the next slide. This tends to occur frequently in my optics courses, where many of the slides require extensive work to solve a problem. I have found that I can appease these students by offering to e-mail them a copy of the annotated slide. This can be done in just a few seconds with GoodNotes and the other annotation apps. The selected slide(s), along with any annotations that you made, are saved as a .pdf document and can be exported via e-mail or several other methods. I also use this feature when I need to correct an error in my notes. I can mark where the error is, along with any explanations and corrections, and e-mail this to my students or post it to Blackboard. In optics, it can be particularly useful to use GoodNotes to create a key for problem sets, complete with color-coded diagrams and explanations. Or, when a student e-mails me a question, I can quickly create a document that can clearly explain how to solve a problem. For particularly complicated problems that I find myself explaining over and over again, I have used ShowMe or Explain Everything to create a video.

At times it is difficult or impossible to

obtain an electronic copy of a document that I want to distribute. In these cases, I use Genius Scan (free) to take a photo of the document. The app converts the photo into a .pdf document and allows it to be e-mailed or opened in other apps. I recently used this app to send a recommendation letter on behalf of a student. The organization required that the document be on letterhead and signed, but also sent via e-mail. After I printed the letter, I signed it, took a photo with Genius Scan, and attached the .pdf to my e-mail.

Transferring Files

Those who are accustomed to storing files on a flash drive for portability may feel hindered by the lack of a USB port on the iPad. The iPad does not have a traditional file storage system. Each file is stored only within the relevant app. At first, I thought it would be cumbersome to e-mail myself every file that I wanted to open on my iPad. However, the functionality of the iPad makes it simple, and I hardly even think about it now. Once I have received an e-mail, it takes less than 10 seconds to have an attached file opened in an app on my iPad. Once the file is opened within an app, it will be saved there, and the e-mail can be deleted. Similarly, each app will almost certainly have an export or share function that allows a file within that app to easily be sent via e-mail. Using e-mail to transfer files is familiar and simple, but it is limited by the attachment sizes that are allowed by your e-mail client. When I need to transfer a

very large file, I connect the iPad to my computer and use iTunes to drag and drop files to and from apps.

Most apps used for reading or altering files are also compatible with various cloud storage options, such as iCloud, DropBox and Google Drive. These and many others each have a certain amount of free storage and allow extra storage for various prices. At this point I have not integrated any of these services extensively into my workflow, but many of my students and colleagues find them very convenient. They allow a file to be accessed from any computer or mobile device with an internet connection, and the file size is only limited by the amount of storage available on the account. In addition, many allow for easy collaboration with other users because a document can be shared and edited within the cloud by all who are given access.

Accessories

Several types of accessories may make the iPad more useful to a teacher. The accessory I have found to be the most essential is my stylus. I use several applications that capture handwriting on the screen. For natural, legible handwriting, and the ability to draw accurate diagrams, a stylus is much preferred to simply using my finger on the screen. Available styluses range from generic models for around \$2 to specialized models for more than \$100. Modern touch screens, as on the iPad, require a rather large area of contact with the

screen in order for a stylus to be detected. Therefore, most styluses are made with a large rubber-like tip, and it can feel similar to using a toddler's crayon. For better precision, some models employ a clear disc to allow the user to see what and where they are writing while still maintaining enough surface area on the screen. I have used the Adonit Jot Pro (\$30, Amazon) for more than a year. (Figure 2) Initially, it had major issues with skipping and poor conduction, but after I applied a tiny amount of thermal compound (\$12, Radio Shack) between the disc and the tip, it has worked flawlessly for months. I have also borrowed a Dagi stylus (\$20, www.dagi-stylus.com), which has a similar design, for a few small projects and was happy with its performance.

Depending on the exact app you're using and the type of drawing or writing you're doing, you might find it difficult to write on the iPad screen in one location without the side of your hand or wrist activating the screen in another location. Some applications have "palm rejection" settings to cut down on stray marks, and a few styluses even use a Bluetooth connection to allow you to rest your palm on the screen. The Hand Glider (\$25, www.thehandglider.com) is a partial glove that blocks the side of your hand from activating the iPad screen and allows you to write naturally with a stylus. (Figure 3) I use this during lectures while drawing diagrams in GoodNotes and when I am creating tutorial videos with ShowMe or Explain

Figure 2

The Adonit Jot Pro uses a clear disc tip, which improves precision for writing and drawing on the iPad.



Figure 3

The Hand Glider allows your hand to rest naturally on the iPad without activating the touch screen.



Everything. Many students wonder what type of fashion statement I'm trying to make, but it has made a lot of my work on the iPad much neater and easier.

For extensive document creation or for writing numerous or lengthy e-mails, the on-screen touch keyboard may prove frustrating. Luckily, dozens of iPad keyboards are on the market. Most iPad keyboards also serve as a case to protect the iPad and as a stand to allow it to sit upright, similar to a laptop computer. They connect to the iPad via Bluetooth. While most need to be charged (very infrequently), a few are solar-powered. I personally do not use a keyboard with my iPad, so I will refer readers to an in-depth review of some of the more popular models at www.macworld.com/article/1164210/macworld_buying_guide_ipad_keyboards.html.

One last accessory I'd like to mention is the Padlette (\$20, Amazon). While a benefit of lecturing with the iPad is the ability to move about the room, it can be a bit awkward to hold and use the iPad while walking around. The Padlette is essentially a very strong silicone rubber band that slips around the corners of the iPad. It forms a secure handle on the back of the iPad so that it is easy to hold with only one hand, leaving your other hand free for writing or otherwise illustrating your point. (Figure 4)

Conclusion

After almost two years of using my iPad daily inside and outside of the classroom, it has become an indispensable tool that makes instruction easier and more effective. Some features required time and practice, but for me the result has been a fun and powerful method of teaching and managing a course. I hope some of my experiences will help others to find ways to integrate the iPad into their teaching repertoire. In addition, I am always looking for new ideas from anyone who may be using other apps or methods. Please feel free to contact me with any questions, comments or suggestions at jalthoff@nova.edu.

Figure 4
The Padlette fits around the corners of the iPad to form a secure grip on the back.



Clinic Partners — Teaming Second-Year Scribes with Interns

Leon Nehmad, OD, MSW, FAAO

Dr. Nehmad is Associate Professor at Nova Southeastern University College of Optometry. He taught at SUNY College of Optometry for 15 years, where he was the developer and instructor of record for the second-year Integrative Seminar course.

In last issue's Educator's Podium, Dr. Weissberg outlined the Enhanced Student Training Program at New England College of Optometry, in which second-year students were assigned to perform limited patient testing under close supervision to help prepare them for third-year clinical internship. I would like to add to the discussion by describing an alternative method to meet this goal, instituted five years ago during my tenure at SUNY: the assignment of second-year students as scribes for third- and fourth-year interns.

Designing a second-year optometry student clinical experience that builds upon the first year clinic observations poses a challenge for educators. The educational value of observations leads to diminishing benefits over time with waning student interest and a desire for more meaningful participation. There is a need for increased depth of clinical experience during the second year, yet the students' rudimentary knowledge base and skills limit this. As Dr. Weissberg pointed out, second-year student participation in testing is apt to interfere with exam efficiency, and for this reason our past efforts to pair them with interns as testing assistants has led to them being pushed aside in the exam room by their senior colleagues. Finally, dividing patient testing between second-years and interns deprives the latter of needed experience.

An alternative program was instituted in 2008 when the college began a new curriculum, the hallmark of which

was the Integrative Track, a three-year sequence of courses aimed at integrating classroom, clinic, and small group learning. As part of this sequence, we established clinic partners consisting of second-year scribes and third- or fourth-year interns.

A survey of students and faculty conducted prior to the start of the new program revealed overwhelmingly that the major difficulty in entering clinic in the third year was becoming comfortable with the electronic medical record (EMR). The EMR is a complex program, and brief training sessions were not sufficient to provide students with a level of competence necessary to conduct an efficient exam. Time in the exam room was spent learning to navigate the EMR at the expense of developing clinical skills. Another significant problem was a lack of familiarity with the entire exam sequence, as first-year observations were limited to an hour, permitting students to observe only fragments of the exam.

As a result, students now acquire EMR experience by scribing throughout their second year, prior to internship. EMR is taught at the start of the fall semester, and students are drilled for several weeks using sample cases and role-playing incorporating all case documentation. Once they have demonstrated competency in teaching lab, they are permitted to scribe in clinic. They are paired with an intern for one half-day clinic session per week. Seminar leaders introduce them to one another and outline their respective duties, with ex-

plicit guidelines:

- The scribe is solely responsible for entering all the information into the EMR, including the history, results, impression, plan, disposition, and billing. Under ordinary circumstances, the intern is not to enter information into the computer or interfere with the scribing. However, if a significant problem emerges that impacts the exam, the intern may take over the entry of information for a portion or the remainder of the exam.
- The scribe's job is to enter the relevant material into the EMR. In order to accomplish this it is the intern's responsibility to conduct the exam in a manner conducive for scribing. The intern needs to distill the pertinent material and dictate it at a reasonable pace, in a clear, organized, succinct fashion to achieve a well-written and professional case record. In order to accomplish this, the intern needs to know where the scribe is at all times in the EMR templates.
- Neither the scribe nor the intern is to use pen and paper to "transcribe" information. It is to be entered directly into the EMR.
- The two work together as a team with ongoing communication and clarification as necessary to address any problems.
- The primary purpose of the partnership is not for the intern to