The Novice's Guide to Teaching with Technology By Andrew Beckerman-Rodau^{*}

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Introduction

The pervasiveness of computers and their related technology makes it hard to avoid wondering if perhaps all professors should be using some technology in the classroom. For many, the mere thought of trying to understand the digital lexicon is enough to make them abandon the idea. Computer professionals and technology support staff frequently speak in a foreign language called "computerese." Terms such as RAM, firewall, adware, bugs, WAV, MP3, USB, among others, seem to be liberally sprinkled into conversations.

Nevertheless, neither a detailed understanding of such terms nor an understanding of how computers operate is necessary to utilize technology in the classroom. This article will provide a justification for incorporating technology into law teaching and suggest some uses of technology that can be adopted without a great degree of technological know-how or access to expensive hardware or software.

I. Why Use Technology?

The current generation of students appears to have been born with a cell phone in one hand, a laptop in the other, and an iPod attached to their ears. Additionally, an increasing number of law students use laptops in class. Consequently, students often expect their instructors to incorporate technology into the teaching environment. Since students are often viewed as "consumers" and customer satisfaction is the life-blood of any enterprise, it could be argued that technology utilization is expected and required to satisfy student expectations.

In addition, there is a strong temptation to use technology simply because it is there. Many law schools have installed computer ports at every seat and have the capacity to employ PowerPoint in classrooms. The very existence of this technology can create subtle pressure to use it.

While the ubiquitous nature of technology and student expectations might first draw us to explore its use, any new teaching methodology should be adopted only after evaluating how it will enhance the effectiveness of teaching.

There are numerous pedagogical reasons for teaching with technology. First, if properly used, technology can enhance the learning environment. Traditional law school classrooms are oriented toward auditory learning. Questions and hypotheticals are posed by the professor, and students must listen and then orally respond. Classmates must pay careful attention to exchanges

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between the professor and other students. However, many students learn primarily by nonauditory means such as visually or tactilely. Technology can level the playing field for these students and thereby enhance the learning environment.

Technology can also extend learning beyond the classroom and provide both faculty and students with more flexible communication. Though one-on-one interaction is still the best learning environment, both students and faculty are increasingly busy. Students in particular often have work and other commitments competing with legal studies. Technology can be used to interact with students remotely. Even though such interaction is less than ideal, in many cases the alternative is minimal or no interaction. For faculty members, technology can improve efficiency, which is increasingly important in order to meet the numerous demands on time created by teaching, scholarship, and committee work.

Finally, law schools are professional schools that prepare their students to enter the legal profession. Today, that profession demands the use of computers for increased efficiency and productivity. Also, many clients utilize e-mail for communicating with outside parties, including attorneys. Hence, student exposure to and use of technology in law school prepares them for the digital environment they will encounter in practice.

II. Equipment Needs – The Basics

The amount of technology available varies among law schools. However, despite disparities in installed technology, virtually all law schools provide faculty members with a computer on their desk, Internet access, and e-mail. These simple tools are adequate to engage in substantial use of technology. Add to this an inexpensive hand-held digital recorder and a scanner, and you have the capability to make your students believe you are a technology whiz in addition to a legal whiz. Such digital recorders are available today for under one hundred fifty dollars; scanners are available for under sixty dollars. However, you may already have high quality scanning apparatus in your faculty office suite. Modern copy machines utilize digital scanning technology to make copies. Hence, many copy machines have scanning and faxing capabilities built in which simply need to be activated. Additionally, if the copy machine is networked it may be capable of e-mailing you anything that is scanned.

III. E-Mail

E-mail is one of the easiest types of technology to use. It enables students who may be unable to see a professor during office hours, such as part-time evening students, to interact individually with the professor. Also, some students who are too intimidated to initiate face-toface interaction outside of class are comfortable corresponding by e-mail. E-mail improves efficiency, enabling a professor to choose the time or place to read and respond. Additionally, it is not unusual to get e-mails from several students raising the same or similar questions. In this case, responses can be individually, but rapidly, sent to each student by cutting and pasting the text into several e-mails.

Creating an e-mail list of all class members is a quick way to contact the class regarding notices of class cancellations, changes in assignments, etc. It can also be used to inform the class

about recent news items or cases relevant to material discussed in class. Such information has great educational value because it enables students to see that legal rules and issues discussed in class have real world, contemporary applications. Contemporary issues or disputes tend to be more interesting to students since they seem more relevant. For example, I start my first year property class with the classic case of *Pierson v. Post*. Often many students have difficulty relating to the case since it deals with two hunters claiming ownership of a fox fatally shot during a fox hunt. However, the year Barry Bonds hit his seventieth home run I sent an article via e-mail about the dispute between two baseball fans over who caught the ball and hence owned it. I related it to *Pierson v. Post* and this helped the students understand the relevant property rules regarding the relationship between possession and ownership.

Using an e-mail list raises two technical issues. First, how is an e-mail list created? This can often be done by the computer services people at your institution. E-mail lists (also called listservs) can be set up with Listserv software, a product that has been around for a long time. Alternatively, you can collect student e-mail addresses and type them into an e-mail program that allows you to create a group composed of these addresses. An e-mail addressed to the group will then go to all class members. Increasingly, e-mail list creation has been automated at many schools that use a learning management software program such as TWEN or Blackboard (learning management software is discussed below).

Another technical issue that is often raised involves the ability to place information, such as a newspaper article, into an e-mail. Several options exist. One can obtain the article on-line via the Internet and paste it into an e-mail. Although a viable option, this can be time consuming and sometimes difficult due to technical hurdles. Alternatively, the article can be scanned and forwarded to you on a disk or via e-mail. You can then forward it to students either as an e-mail attachment or as part of the body of an e-mail.

I have found several other important uses for e-mail. Sometimes class time ends before class discussion has ended. Often this causes me to run over my allotted class time, which results in dirty looks, sneers, and threats from faculty members teaching the next class. In lieu of this, and to avoid hate mail, I often send a follow-up e-mail right after class to tie up any loose ends from class discussion. I will use an e-mail to answer questions raised in class that were not fully answered due to time limitations. I find it useful to explain the connection between the topics discussed in class that day and prior class discussion of other topics. I also provide students with questions and problems based on class discussion which they can use to improve their understanding of the material and develop analytical skills. Finally, I will send a follow-up e-mail correcting anything I said in class that was misleading or incorrect.

One pitfall I have discovered is that in my zeal to provide students with additional material, I have sometimes overwhelmed them by sending too much. This can increase the stress already felt by law students, and is clearly counterproductive. An effective solution is to divide e-mail messages sent to the class into two categories: messages they should read; and messages I call "enrichment" messages (which means students might find them interesting but it's not critical that they read them). All messages which fall into the second category, including newspaper articles, contain the letters "FYI" in the subject line. I tell students at the beginning of the semester that any e-mail with "FYI" in the subject line is optional and can be deleted without

reading it. I have not had any complaints about too much e-mail since adopting this approach, and I know some students are reading the optional e-mails because I get questions about them.

IV. Discussion Boards

Discussion boards (or "threaded discussion lists") are analogous to e-mail lists. Everyone subscribed to the board can post messages which everyone can see and respond to. Increasingly, I have switched to discussion boards in lieu of e-mail. They are easy to set up and use, and are usually a standard feature included in most course-management software such as TWEN or Blackboard.

Discussion boards also have certain advantages. First, everything posted remains available for the entire semester. This is efficient for both faculty members and students. When a student can't find prior e-mails it causes stress for both the student and invariably for the professor who spends time looking for it. A discussion board eliminates frantic student requests for e-mails sent to the class earlier in the semester.

Discussion boards are also an efficient way for a teacher to answer questions. When I used e-mail I often found myself answering the same or similar questions for different students. In contrast if the question is posted on a discussion board both the question and my answer are available to the entire class, greatly reducing repetitive questions.

Discussion boards can also provide a structured repository for the questions, answers, and miscellaneous information posted during the semester. I have found it useful to create a different discussion board for each topic covered. This makes it easy for students to review prior posts since they merely have to go to the appropriate discussion board rather than scroll through all the messages.

In addition to topic-specific discussion boards, I also create one board for general announcements and one for student feedback. The general announcement board provides a place to post class announcements and information about lectures, CLE programs, or other things of interest to the students. I have found that electronic dissemination of such announcements can increase student attendance at lectures and programs, and I have had students tell me the general information posts were useful and greatly appreciated.

The student feedback discussion board allows students to air complaints about the class, law school, etc. It also provides a forum for making suggestions. Generally, I have found this board useful—it makes me aware of issues in the class that I might not otherwise know about. Additionally, students have on occasion made constructive suggestions that I have adopted. On several occasions, these posts allowed students to resolve perceived class problems without my intervention. Overall, the level of posts has been very professional.

It is also important to allow students to make anonymous posts. This increases student use of the boards. This is especially true for students who are posting substantive questions. Law school tends to make students feel insecure, so many will not post a question for fear of sounding stupid. Hence, the anonymous option increases student postings. My experience and that of others I've talked to, indicates that student posts only occur in first-year classes. Upper class students tend to view the boards as a one-way medium used by professors to convey information to the class.

V. PowerPoint – A Killer Application, or a Way to "Kill" Student Interaction?

Despite being a long time technology user I tried using PowerPoint[©] in class only a few years ago. I have found PowerPoint to be an incredibly useful pedagogical tool if used correctly.

A. Reasons to Use PowerPoint

It is imperative that PowerPoint only be used if it has a clear pedagogical purpose. PowerPoint cannot be a substitute for teaching. Nor can the adoption of PowerPoint as a teaching tool enhance teaching unless careful thought goes into identifying the specific teaching goal you are trying to achieve.

I use PowerPoint to supplement classroom teaching. For example, when covering a problem in class I will state the problem to the class while it is projected on a PowerPoint slide. This makes it easier for students with differing learning styles to participate. Students who are auditory learners simply listen to my statement of the problem. Students who are visual learners can read the problem on the slide. I also try to make the slides available prior to class for students who want to read and think carefully about the problem in advance (admittedly, this is generally a small number of students). I also leave the slide showing the problem up during the entire discussion. This allows students to refer to the problem during discussion, rather than working from memory.

Whenever possible, I provide a graphic or picture illustration of the problem. Other problems are more appropriately illustrated by a time-line which shows the relevant actions and accompanying dates. Such graphics or time-lines allow students to work through the problem at a higher level since the relevant information can be seen throughout the entire classroom discussion. Such graphics, pictures, and time-lines can similarly be used as a backdrop when discussing an assigned case.

When I discuss a statute I will often project it on a PowerPoint slide rather than asking the students to look at the statute in their casebook or statutory supplement. I have found this to be a more efficient approach. It avoids typical student comments such as "I forgot to bring my statutory supplement," or "what was that statutory number again?" Additionally, it forces students to look up at the slide, which means they can't engage in the time-honored behavior of staring at the book and hoping they won't be called on. Instead, if they are looking up it is easier to make eye contact, which facilitates increased involvement.

Difficult legal concepts and rules of law can sometimes be made more understandable via a graphic illustration. I find that showing students a graphic on a PowerPoint slide increases comprehension significantly. It also allows you to illustrate the application of concepts and rules of law to modern day situations. For example, it is easier to discuss trademark infringement by projecting the products on a PowerPoint slide, rather than discussing it in the abstract. Finally, the entertainment factor of PowerPoint should not be overlooked. Effective teaching has in it an element of entertainment. It helps keep students interested, which makes it more likely they will be engaged in the class discussion. Nevertheless, it is important to avoid getting carried away lest the presentation be memorable primarily for its entertainment value rather than for effectively teaching the material.

B. Some general rules for using PowerPoint

Generally, the amount of text on a PowerPoint slide should be minimal. Like legal rules however, exceptions exist. A set of PowerPoint slides should not be merely a replication of your class notes for a specific class. If a student could look at the slides in lieu of attending class, then PowerPoint is too densely loaded with text.

PowerPoint should not drive or control class flow. Class discussion may deviate from the predetermined order of the slides created prior to class. Consequently I will often find it pedagogically useful to jump around among the slides I have prepared. Rather than memorizing the number of every slide, I bring a hard copy of the presentation to class. I also put slide numbers on each individual slide. This enables me to jump around if necessary. A neat trick is to simply type in the slide number then hit "enter," and this will automatically bring you to that slide. It is also not necessary to use every PowerPoint slide you have prepared for class. Often I skip some due to time constraints or because in light of class discussion some slides will not advance the topic. It can be hard to skip a slide, especially when you may have devoted substantial time to creating a masterpiece, but it's important to resist the temptation and not use a slide just because you spent a lot of energy creating it.

When discussion deviates from what is being shown in a PowerPoint presentation, or if you want to draw student attention away from the slides, a great shortcut is to press the "B" key on the computer keyboard. This instantly suspends projection of the slides, leaving a blank screen. Pressing the "B" key a second time instantly turns PowerPoint projection back on.

C. Making PowerPoints—you don't have to be a computer expert

Microsoft's PowerPoint program, like Word, contains hundreds of different features. Attempting to master all of them is daunting and liable to cause you to opt out of using the program. However, it is possible to make exceptional PowerPoint slides by knowing only a limited number of program functions.

(1) Format function: Fonts

Knowing how to format fonts allows you to do several things:

- Select different fonts
- Use different size fonts
- Use different color fonts
- Use different font effect such as bold and italics

While this function can be accessed in a variety of ways, the easiest method is to go to the "format" button at the top of the main PowerPoint screen. Once it is clicked an item titled "font" is available. All of the above font formatting functions are available there. Using different size and color fonts is an excellent way to make the slide more readable. Generally, I bold all text to improve readability, and I have found that a combination of the colors black, red, and blue work best in a PowerPoint presentation.

(2) Format function: Bullet Points

Bullets or arrows should be used sparingly. These are also included under the "format" pull-down menu. Once this menu is opened click on the second item, "Bullets and Numbering" to gain access to a variety of bullets or arrows that can be inserted where appropriate.

(3) Insert function: Text Boxes

Using the insert function opens up substantial opportunities for enhancing PowerPoint. To access this function go the "Insert" menu at the top of the screen. Once it's clicked you will see a menu listing several functions. The "Slide Number" function can be used to put numbers on all PowerPoint slides. This is helpful if you jump around or want to go back to a previous slide.

The "Text Box" function is one of the most useful features in PowerPoint. It allows you to insert text anywhere on a slide. Likewise, you can move the text freely around the slide without affecting any other text or material. The text inserted with this function can also be formatted without affecting other text on the slide. To use this feature right click on the words "Text Box." Then move the cursor to a slide and click on the slide. A small box will appear on the slide – this is the "text box." After inserting text into this box you can freely move the box around the slide. You can also easily change the size of the box by pulling on a corner with the mouse while holding down the left button. Finally, right clicking the mouse on the text box will bring up a menu that contains the function "format text box." This allows you to move the text to any location on the slide. However, when the PowerPoint is projected the text will appear without any indication you are using a text box. Using multiple text boxes allows text to be quickly positioned at various locations on a PowerPoint. (As an aside, text boxes can also be used in Word to avoid difficult formatting problems.)

(4) Insert function: Pictures

Under the "Insert" pull-down menu, you will see "Picture." This function allows you to insert a picture into a PowerPoint slide without worrying about details such as which format the picture is in. When you click on "Picture" another menu will appear. The "From File" option can be used to insert any graphic file or picture on your computer into a PowerPoint slide. The "Clip Art" option enables you to access a variety of pictures and images contained in the software. Once inserted, the size and location of the graphic can be easily changed. A left mouse click with the cursor on the picture allows you to move the picture around as long as you hold the mouse button down. Also, if you put the cursor on the graphic and click the left mouse button once, the picture goes into a mode allowing you to change its size. If you put the cursor on the corner of the graphic and hold the left mouse button down, the picture will change size proportionally as you either move the cursor inward to make the picture smaller or outward to make it larger.

(5) Insert function: Symbols, Special Characters & Hyperlinks

This function allows you to insert a variety of boxes, circles, and arrows into a PowerPoint slide. Under the "Insert" pull-down menu, click on "Pictures" and then on "Autoshapes." A small box will appear with a series of shapes in it. Left click the mouse over the shape you want to insert. Then left click the mouse over the PowerPoint slide and the shape will automatically appear in the slide. You can move around or change the size of the shape or arrow the same way you work with pictures. Clicking the right mouse button on the inserted shape will bring up a menu. Clicking on "Format Autoshape" will enable you to change various attributes of the shape such as its color.

D. Sample PowerPoints

I have included examples of PowerPoint slides I use in class (*See* Appendix). In most cases, these slides were made using only the functions discussed in the previous section (the actual slides use multiple colors).

Fig. 1 is a diagram of a patented invention used in my patent law class during discussion of a problem involving this invention.

Fig. 2 is used in my intellectual property law class during discussion of the Supreme Court decision in *Chakrabarty* (slide includes animation showing the new bacterium eating the oil spill which was its function).

Fig. 3 is used in my patent law class when examining the parts of a patent claim.

Fig. 4 is used in my intellectual property law class during a discussion of the different types of trademarks, coupled with several problems requiring students to categorize different trademarks.

Fig. 5 is a time-line used for a problem discussed in my patent law class.

Fig. 6 is a graphic representation of a problem involving assignments and subleases which I use in my property law class.

Fig. 7 is a problem discussed in my property law class.

Fig. 8 is a graphic representation of an easement problem used in my property law class dealing with the issue of enlarging a dominant estate.

VI. Using Audio Files

Audio files are the newest technology I use. On a limited basis, I make digital audio recordings of class for students who are absent due to illness or some other pressing reason. I also have made short digital audio files for specific topics including hints on how to study, how

to brief cases, and how to take a law school exam. I have also recorded detailed answers or explanations for assigned problem sets and recorded optional review classes at the end of the semester. Using audio files can significantly improve efficiency for the teacher and for the students. For example, finding a time that works for both the teacher and all students to attend optional classes such as review classes is often difficult. Students have increasingly busy lives often including work and family responsibilities. Hence, audio files can be used in lieu of an optional live presentation, or a professor can make an audio file of it available for students who are unable to attend. Other audio files on how to study, or answers and explanations to problem sets can be made once and reused for subsequent semesters, freeing up time for faculty members to engage in other activities.

The creation, use, distribution, and management of audio files can be done with minimal equipment. Some schools have built-in hardware and also have technical staff to make digital audio files on demand in the classroom. CALI is also working on a project which will allow a professor to record a class via an ordinary telephone. CALI will then make that file available to students via a blog.

Alternatively, you can use a small, handheld digital recorder to create audio files. Such recorders are smaller than an iPod and cost less than one hundred fifty dollars. I use a battery operated Olympus digital recorder which can record for several hours. It has a built-in microphone which picks up everything I say when I am teaching a class. It doesn't always pick up students but this can be remedied to some extent by repeating student questions and summarizing their comments. Whatever brand recorder you use, it must have the ability to transfer a recorded audio file from the digital recorder to a computer. Recorders utilize a variety of methods to export files. One common method, which I use, is an output port on the recorder connected via cable to a computer's USB port. Such ports have become standard on virtually all computers today.

Once an audio file is created and transferred to your computer two issues remain. First, how do you make it available to students; and second, what audio format should the file be in to minimize student problems downloading and listening to the files? If your school has unlimited technology funds you should have them purchase a streaming server which can be used to handle audio files. However, if your school is located in the real world of limited funds, you can upload the audio file to course management software (such as TWEN or Blackboard), discussed below. Once uploaded to TWEN or Blackboard, students have access to the audio file 24/7 from virtually any location in the world with Internet access. Audio files tend to be large so I usually recommend that students download the file and listen to it after it is downloaded. I also warn students that because of the file size the download may take five to ten minutes, if they have a broadband Internet connection, and up to several hours if they have a dialup Internet connection. Students can also download the file in the school's computer lab onto a small keychain drive or burn it to a CD.

Numerous types of audio file formats exist. Some have no compression, resulting in extremely large files. Others have differing amounts of compression and varying sound quality. From a practical perspective it is important to use an audio file format that is sufficiently common that most students will be able to handle it without having to worry about adequate hard drive space and file conversion issues. Currently I use the MP3 audio file format, which uses

compression to reduce file size. This same format is commonly used for music downloaded from the Internet, and most computers purchased within the last few years include software that will automatically recognize and play an MP3 file.

Unfortunately, digital audio recorders use a variety of audio file formats. Many even use proprietary formats, although they often include free software which will convert the proprietary format into other formats. For example, the Olympus recorder I use creates files in a proprietary format. But the free software included with it automatically downloads audio files from the digital recorder to my desktop computer and automatically converts it to WAV format. I then use a twenty dollar program which converts the WAV format to virtually any other audio file format including MP3. Unfortunately, this lack of file format standardization which necessitates file conversions, increases the complexity of using audio files. However, it generally takes less than fifteen minutes for me to export a file from the digital recorder, convert it to an MP3 file, and upload it to course management software so it is accessible to students.

VII. Course Management Software

Course management software (sometimes called learning management software), is accessible via the Internet and can greatly ease the use of technology for teaching. It is a single place for faculty members to go to set up e-mail lists, discussion boards, and to make files (text, PowerPoint, audio, etc) available to students. Likewise, students only have to go to a single site to access all these resources and materials. Additionally, having the site accessible via the Internet enables both faculty members and students to upload or download materials from any location with Internet access 24/7.

In the past I have utilized my own Web site to provide the course management software function to my students. Building and using your own Web site allows you to customize the site to satisfy your own idiosyncrasies. However, it requires learning HTML among other things. Frankly, I do not believe it is worth the time and effort involved.

Alternatively, several well-designed course management software programs are available in the marketplace. For example, Blackboard is one program used by many universities. Utilizing Blackboard, or a similar program, operated by your university allows the software to be customized and directly integrated with the registrar's computer system. Nevertheless, if your school lacks the resources and personnel to operate course management software in-house, excellent programs are available free to law faculty from West Publishing and Lexis-Nexis.

West provides a proprietary system call TWEN, which can be accessed via the Internet with a conventional Internet browser program (this is the program you use to surf the Internet). Lexis-Nexis runs Blackboard on its own servers and makes it freely available for use by law faculty members.

I have experimented with both TWEN and the Lexis-Nexis version of Blackboard. Despite advertising hype, both provide similar features and have good technical support. Both also allow you to set up a site for each course you teach. They each provide the ability to use class e-mail lists, discussion boards, and upload all types of files for student use. Finally, and perhaps most important, both West and Lexis-Nexis assign each law school a representative who can answer questions and assist you in using either TWEN or Lexis-Nexis Blackboard. Your law librarian can put you in touch with the appropriate representative.

Although each program is quite flexible and contains numerous options, I have a few suggestions which apply equally to both. If you aren't running a local program that is integrated with the registrar's computer system, I have found that allowing students to register themselves with either TWEN or Blackboard causes the least trouble. Additionally, both programs include a notification function which should be activated. This function automatically sends an e-mail to students whenever something new is posted by the professor, and when students post to a discussion board. Finally, although both systems allow you to upload files in virtually any format, you will have the fewest problems if you convert all files to PDF format and then upload them in that format. PDF is basically a graphic version of a document. Hence, it will look the same when viewed on any computer system. Also, it has become a very dominant and common format which most computers will be able to open. A free program, Adobe Reader, which can be downloaded off the Internet by anyone, is the only software needed to open and view PDF files. Creating PDF documents is also easy. If your school has a license for Adobe Acrobat you can load this on your computer. It integrates itself into your word processing program so that any document can be converted into PDF format with a few mouse clicks. If your school doesn't have a license for Adobe Acrobat a variety of free or inexpensive programs for converting documents into PDF format are available. If you only need to convert files into PDF it is not necessary to purchase Adobe Acrobat. This program is a high-powered program which allows editing of PDF documents, among other things. It is overkill if all you want to do is convert documents into PDF.

Conclusion

Venturing into the world of teaching with technology can be accomplished in most schools without the purchase of expensive computer equipment and software. Properly used, technology can enhance student learning while creating time efficiencies for both students and faculty members. Additionally, technology has become ubiquitous in the modern practice of law so acclimating students to its use facilitates their preparation for entering the practice of law upon graduation.

APPENDIX

Problem: Coffee cup holder



Sheet 6 of 8' 5,205,473

U.S. Patent

Apr. 27, 1993



Oil Spill

 Invention = New bacterium



• Novel?

- Useful?
- Statutory category?

Fig. 3

PARTS OF A CLAIM

PREAMBLE Apparatus for measuring electrical current, comprising: TRANSITION

(a) an electronic sensing device;

BODY

(b) an electronic computation device; and

(c) an output device for providing visual data representing measured current.

Categories of Marks





Fig. 5







Q: What is the state of the title after B dies?

