

Technology in the LRW Curriculum – High Tech, Low Tech, or No Tech¹

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I. INTRODUCTION

The technology bandwagon is making its way into legal education. As more and more law school brochures tout the technological enhancements available at their law schools, professionals in the legal research and writing (“LRW”) field are considering when, how, or even if they should integrate new technologies³ into the LRW curriculum. All new lawyers will require at least some technological expertise to function effectively in their law practices.⁴ Thus, among the many skills we try to

¹ This article is based on a panel presentation that the author participated in entitled “Achieving Specific Goals—High and Low Tech” given at the 1998 Legal Writing Institute Conference in Ann Arbor, Michigan on June 20, 1998. The author thanks Professor Richard Perna for reviewing drafts of this article and offering helpful comments. In addition, the author is indebted to James Levy and Dennis Yokoyama for their editorial assistance.

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³ The term “technology” refers to information technology (the computer skills needed by both law students and attorneys to manage information), as well as instructional technology (technology used to enhance learning at law school). The distinction between information and instructional technology is subtle, but important. Information technology has been defined as “the acquisition, processing, storage, and dissemination of vocal, pictorial, textual, and numerical information by a microelectronic-based combination of computing and telecommunications.” Michael J. Albright, *Instructional Technology and Higher Education: Rewards, Rights, and Responsibilities* (last modified Feb. 26, 1996) <<http://www.public.iastate.edu/~mikealbr/webcv/papers/srfidc96.html>>. In contrast, instructional technology has a narrower focus and is defined as “a complex, integrated process involving people, procedures, ideas, devices and organization, for analyzing problems and devising, implementing, evaluating and managing solutions to those problems involved in all aspects of human learning.” *Id.* Thus, while there is overlap, the key difference between information and instructional technology is that information technology focuses on the use of technology to accomplish legal tasks. Instructional technology focuses on the use of technology to teach.

⁴ Technology’s impact on the legal profession is of increasing concern. Commentators on law practice management suggest that the key to future survival is productivity, and lawyers are urged to master information technology to increase their productivity or risk extinction. *See, e.g.,* M. ETHAN KATSH, *THE ELECTRONIC MEDIA AND THE TRANSFORMATION*

cover in the LRW curriculum, technological skills are an appropriate and necessary component. Paradoxically, we acknowledge that practicing lawyers require some technological sophistication, but as educators, we may have serious reservations about using it ourselves.⁵ Technology can easily become the focal point in our classrooms, overshadowing "fundamental" skills like legal analysis and reasoning.⁶ While this article examines the different ways technology can and should find a place in the LRW curriculum, I also discuss the pedagogical costs and benefits associated with technology.

Over the past few years, I have experimented with different ways of integrating technology in the first-year LRW curriculum.⁷ I have created and distributed class materials in various electronic formats⁸ and have used technology within the class-

OF LAW (1989); M. ETHAN KATSH, LAW IN A DIGITAL WORLD 172-194 (1995); and William T. Braithwaite, *How is Technology Affecting the Practice and Profession of Law?*, 41 DEF. L.J. 285, 288 (1992)(discussing the negative impacts of technology, including heightened client expectations concerning how quickly legal work can be done).

⁵ These reservations may stem from our own lack of computer skills, the unavailability of technological resources, or a concern that technology may interfere with our pedagogical goals. These are all legitimate concerns in evaluating how, or even if, to integrate technology in the LRW curriculum. See, e.g., Suzanne Ehrenberg, *Legal Writing Unplugged: Evaluating the Role of Computer Technology in Legal Writing Pedagogy*, 4 LEGAL WRITING 1, 2 (1998) (arguing that computers do little to enhance legal writing pedagogy and, in fact, create an additional burden for LRW teachers).

⁶ The American Bar Association recognizes that legal analysis and reasoning are fundamental lawyering skills in the American Bar Association Section of Legal Education and Admissions to the Bar, *Legal Education and Professional Development—An Educational Continuum, Report of the Task Force on Law Schools and the Profession: Narrowing the Gap* (Chicago, 1992). See also, Bryant G. Garth & Joanne Martin, *Law Schools and the Construction of Competence*, 43 J. LEGAL EDUC. 469, 479-486 (1993)(describing survey results in which Chicago area lawyers defined necessary lawyering skills and their assessment of a law school's ability to teach those skills).

⁷ I have taught LRW at the University of Dayton School of Law for nine years. In August 1997, we moved into a new law school building, Keller Hall. The new home of the University of Dayton Law School and Law Library is a technologically sophisticated environment. I was involved in planning meetings on how technology would be used in the new building. In preparation for the move, I experimented with different forms of instructional technology in classrooms with limited technological capability. Thus, while I now work in an environment that is very conducive to the integration of instructional technology, I understand the challenges involved in working in a less technologically sophisticated one.

⁸ In 1996, I developed a course supplement using *FolioVIEWS*, an electronic publishing program that is widely used to re-create textbooks in a digital form. The project won first place in the 1996 LEXIS-NEXIS Legal Research and Writing competition, which recognizes and rewards innovation in educational technology. I also developed my own course web page, have used TWEN (The West Education Network) a ready-made web resource for law faculty, and make extensive use of e-mail to communicate with students.

room to teach legal writing, analysis and research.⁹ In using these various forms of electronic media, I have realized that technology is no different than any other teaching tool. There must be a sound pedagogical basis for using technology in the LRW curriculum, along with the recognition that sometimes "high tech" can be counter-productive.

In this article, I explore the tension between preparing students for a technologically enhanced law practice by integrating these skills into the curriculum and the constraints this technology can place on learning. First, this article examines the rationale for integrating technology in the LRW curriculum. Next, I discuss specific classroom technologies with practical suggestions for getting started and assessing their effectiveness as teaching tools. Finally, this article examines the institutional constraints that may hinder the effective use of technology. Although an LRW teacher may determine that technology could enhance her teaching, economic and structural constraints may create obstacles to its use, or at least limit what options are available. Knowing *why* you want to use technology and *what* you want to do with it, you will be in a better position to get the technological "tools" you need to enhance the LRW curriculum.

II. DEVELOPING A RATIONALE – WHY BOTHER WITH TECHNOLOGY?

Integrating technology into the educational process may prove difficult. The technology may not be familiar to you. You may have gone to law school in an era when computers were hardly used. You may have practiced law at a time when a secretary and a law library made computer skills unnecessary. Moreover, your law school's facilities may preclude much experimentation with technology. You may not have classrooms equipped with the latest technologies. In your office, you may not have a very modern computer or access to e-mail. Even if you have a computer, your students may have better-equipped models with updated software that precludes the exchange of files between you and your students. With all these potential obstacles, you may legitimately ask: "Why bother?"

There are three good reasons why. First, technology is re-defining the skills needed by lawyers to achieve professional com-

⁹ My use of technology includes: *PowerPoint* presentations; the display of electronic documents for in-class editing; the display of case and statutory excerpts for in-class analysis; and live demonstrations of computer-assisted legal research (LEXIS, Westlaw and the Internet).

petence. Second, your students may learn better if you are able to use modern technologies effectively in the classroom. And finally, you may find yourself growing as a professional as your technological expertise creates new career opportunities in law firm consulting or continuing legal education programs. Any of these is reason enough for you as an educator to seriously consider integrating technology into the curriculum.

A. *Re-defining Competence – the Technical Skills Needed in Modern Law Practice*

Important changes are taking place in the practice of law, fueled in large part by the growing use of technology. In modern law practice, the computer is used not just as a means to enhance productivity, but increasingly as a key practice resource. Recent surveys suggest that technology is allowing attorneys to complete more work at their desks, with less reliance on support staff and the library.¹⁰ More attorneys are drafting documents on the computer instead of a yellow pad. They locate legal authority on their computers instead of going to the library.

Moreover, client expectations are re-shaping what it means to be a competent attorney. As clients are able to locate information on the Internet and use their computers to communicate with others, they expect their attorneys to have these skills as well. The pervasiveness of information technology has “raised the bar” on the level of technological competence clients expect from their attorneys. This shift in how lawyers work and are expected to work has re-defined professional competence.

At the recent ABA Techshow, Richard Granat, a noted legal systems consultant, described the new technology skills essential to law practice as follows:¹¹

- *Electronic Information Retrieval skills*—the ability to design, create, and retrieve information from databases for clients.

¹⁰ See ABA Legal Technology Center, *Large Law Firm Technology Survey—1997 Executive Summary* 3, 5[hereinafter *Large Firm Survey*] (finding that 90% of the lawyers responding had a computer on their desk and 80% reporting that they created their own work product with less reliance on support staff). See also ABA Legal Technology Center, *Small Law Firm Technology Survey—1997 Executive Summary* [hereinafter *Small Firm Survey*]; *The Internet Lawyer Microsoft Corporation Survey* (visited August 8, 1997) <<http://www.internetlawyer.com>> [hereinafter *Microsoft Survey*] (reporting an increasing reliance on technology within the law practice setting).

¹¹ Richard S. Granat, *Re-Training Lawyers for a Digital Age* (March 28, 1998) <<http://www.digital-lawyer.com/retrain.html>> (from a presentation at the 12th Annual ABA TECHSHOW 98).

- *Electronic Communication Skills*—knowing when and how to use e-mail to communicate with clients and colleagues.
- *Electronic Publishing Skills*—having the capacity to produce multimedia legal documents and file or deliver them electronically.

Since legal professionals are no longer the only ones with access to legal information, their expertise will be measured in how efficiently they can locate and use such information.

While it may be argued that many of these skills can be developed in practice, law schools should at least provide exposure to electronic retrieval, communication, and publishing skills. Thus, one rationale for integrating technology in the LRW curriculum is that it allows law schools to better prepare students for modern law practice.

B. *Technology's Impact on Learning*

In developing a rationale for using technology in the LRW curriculum, its pedagogical effectiveness should be considered. Begin by assessing your pedagogical goals—what do you want to accomplish in your class? The pedagogy of the LRW class may be narrowly defined as “skills training”¹² or have a broader focus that encompasses the development of sophisticated problem-solving skills, legal analysis, and the ability to effectively engage in legal discourse.¹³ Whether one approaches the LRW class as an opportunity to teach practical skills or to develop legal cognitive skills, or both,¹⁴ the influence of technology on those peda-

¹² See Garth & Martin, *supra* note 6, at 472 (describing the various skills needed in law practice that can be effectively taught in law school).

¹³ Many writers have attempted to construct a pedagogy for LRW. See, e.g., Lorne Sossin, *Discourse Politics: Legal Research and Writing's Search for a Pedagogy of its Own*, 29 NEW ENG. L. REV. 883 (1995) (comparing “practice pedagogy” and “doctrinal” pedagogy); Mary Ellen Gale, *Legal Writing: The Impossible Takes a Little Longer*, 44 ALB. L.REV. 298, 300 (1980) (stating that at a minimum, a legal writing program should provide students with a “rigorous, individual, intellectual exercise in the close analysis of legal materials, primary and secondary, and with a set of guided experiences in the major work of lawyering . . .”). See also Michael I. Swygert, *Striving to Make Great Lawyers—Citizenship and Moral Responsibility: A Jurisprudence for Law Teaching*, 30 B.C.L. REV. 803, 805-806 (1989); Natalie A. Markman, *Bringing Journalism Pedagogy into the Legal Writing Class*, 43 J. LEGAL EDUC. 551 (1993); Arturo L. Torres & Karen E. Harwood, *Moving Beyond Langdell: An Annotated Bibliography of Current Methods for Law Teaching*, 1994 GONZAGA L. REV. 1, 29-31 (1994) (containing a comprehensive list of articles on the developing pedagogy in LRW programs).

¹⁴ In part because there is not yet a well-defined pedagogy for the LRW curriculum, teachers are free to craft their own. For example, in my own classes, I place a great emphasis on the ability to discern the critical facts in a legal precedent and compare them

gical goals is inescapable.

The impact of technology on learning in law school is only beginning to be studied.¹⁵ While there have been positive reports on how technology affects learning,¹⁶ negative reports have emerged as well.¹⁷ Among the advantages of instructional technology is that it allows more active class participation. It can also create more opportunities for collaborative learning. For example, the teacher can use a projection device to focus on the language of a statute or case to demonstrate critical reading skills. Projecting the text on a screen helps focus student attention and generates discussion on the proper reading and interpretation of the text. A student's writing, such as a "Question Presented" or a thesis paragraph, can be displayed and edited collaboratively through class discussion. The LRW teacher can conduct an Internet search during class while students suggest the research strategy and search terms. Any of these techniques

to a hypothetical client's case. The ability to make these factual distinctions is a needed skill as students must devise efficient ways to evaluate the growing amount of available case law. Since technology has made it possible for more case law to be digitally preserved, it becomes even more important for students to make distinctions between cases and develop the ability to hone in on the critical aspects of a legal problem. See SUSAN W. BRENNER, PRECEDENT INFLATION (1991) (describing the increased availability of unpublished opinions in computer databases such as LEXIS and Westlaw).

¹⁵ See, e.g., Richard Warner, et al., *Teaching Law With Computers*, 24 RUTGERS COMPUTER & TECH. L.J. 107 (1998). The authors are associated with the Chicago-Kent College of Law, which has experimented with electronic teaching through its E-LEARN section. Students in the E-LEARN section are required to own notebook computers and are provided with electronic versions of classroom materials. Although the extent to which technology is used in the classroom varies with the instructors, students in the E-LEARN section are encouraged to use their computers extensively as part of their class and exam preparation. See, e.g., Richard Warner, *Teaching Electronically: The Chicago-Kent Experiment*, 20 SEATTLE U.L. REV. 383 (1997); Richard A. Matasar & Rosemary Shiels, *Electronic Law Students: Repercussions on Legal Education*, 29 VAL. U.L. REV. 909 (1995); David J. Maume, Jr. & Ronald W. Staudt, *Computer Use and Success in the First Year of Law School*, 37 J. LEGAL EDUC. 388 (1987).

¹⁶ Jerald G. Schutte, *Virtual Teaching in Higher Education: The New Intellectual Superhighway Or Just Another Traffic Jam?* (visited Oct. 5, 1998) <<http://www.csun.edu/sociology/virexp.htm>> (reporting a statistical study in which students receiving "virtual" instruction on the computer outperform students receiving traditional in-class instruction). A national study on technology's impact on how students learn and how teachers teach found that technology had a positive effect on student performance, "but only if technology is placed in the hands of trained teachers who use it in the most productive ways." *Technology Counts '98: Putting School Technology to the Test*, EDUCATION WEEK ON THE WEB (Oct. 1, 1998) <<http://www.edweek.org/sreports/tc98>>.

¹⁷ See, e.g., Lucia Ann Silecchia, *Of Painters, Sculptors, Quill Pens, and Microchips: Teaching Legal Writing in the Electronic Age*, 75 NEB. L. REV. 802 (1996) (suggesting that online drafting may exacerbate writing problems); Ehrenberg, *supra* note 5, at 21 (concluding that computers are unable to enhance "the most essential functions involved in teaching legal writing, research and analysis.").

engage the students in active learning, which is often better than passive learning.¹⁸ Electronic instruction, such as *PowerPoint* and electronic discussion lists, can also accommodate a wide range of learning and teaching preferences. Contacts between student and teacher can also increase with the use of on-line office hours.¹⁹

Unfortunately, technology can also have a negative influence in the classroom. It can become a "side show" with students relegated to the role of passive observers. Over-reliance on electronic versions of legal materials can lead to poor reading habits and shallow, if not inaccurate, legal analysis because people read differently online than in print.²⁰ Thus, decisions about whether and how to integrate technology into the classroom should take into account its effectiveness as a pedagogical device in the LRW curriculum.

The effect of instructional technology on LRW pedagogy is underscored by the fact that technology is already widely used by students. Student use of technology is pervasive throughout legal education, and especially within the first year of law school. In some manner, a computer plays a role in their legal education. The use of notebook computers to take class notes is increasing; more students are communicating with their professors and each other via e-mail. Students face technology issues as they fulfill requirements for their LRW class. They use computers to draft their assignments, and to a growing extent, use computers to do legal research. Knowing that students are using

¹⁸ Active learning techniques first achieved prominence in primary and secondary education, and more recently at the undergraduate level. See R.B. Barr & J. Tagg, *From Teaching to Learning: A New Paradigm for Undergraduate Education*, CHANGE, Nov. 21, 1995, at 13. Increasingly, commentators view instructional technology as a way to bring more active learning into higher learning. For example, Professor Diamond offers practical suggestions for using technology in higher education to increase student participation and make faculty more accessible to their students. See Nancy A. Diamond, *Adding On-Line Computer Methods to Your Repertoire of Teaching Strategies*, ESSAYS ON TEACHING EXCELLENCE, Vol.9, No.6, 1997-1998 (on file with author). For commentary on active learning within legal education, see Michael L. Richmond, *Teaching Law to Passive Learners: The Contemporary Dilemma of Legal Education*, 26 CUMB. L. REV. 943 (1996).

¹⁹ See Diamond, *supra* note 18.

²⁰ Although this generation of law students may be more comfortable with computers in general, it is unlikely that they have used a computer to deal with materials containing the level of abstraction and complexity as legal materials commonly have. As a result, they may be lulled into thinking they understand what they read on their computer screens, when in fact, their analysis is incomplete. See Marilyn R. Walter, *Retaking Control over Teaching Research*, 43 J. LEGAL EDUC. 569, 579 (1993); see also Ehrenberg, *supra* note 5, at 7-8. The potential problems associated with reading online are discussed later. See *infra* pp. 14-15 and note 40.

technology to complete work for class means that we, as legal educators, have an obligation to demonstrate the advantages, as well as the disadvantages, inherent in such technology. No matter what our pedagogical goals are, unless we want to restrict our students to pencil, paper, and books, technology will play a role in how our students learn, and consequently, how we teach.

C. *Using Technology to Create Opportunities for Professional Development*

Finally, becoming involved in emerging technologies in legal education, and the profession generally, afford LRW faculty an opportunity to develop expertise and thereby enhance their careers. Among the law school faculty, tenure track faculty may have little time or inclination to learn and develop this expertise. Their energies are more often directed towards more traditional types of scholarship or governance issues at the law school.²¹ The LRW faculty can fill the void and increase their value to the law school.²² Outside the law school community, expertise in emerging technologies can lead to consulting opportunities as law firms grapple with technology issues or invitations to participate in continuing legal education programs. As we become more familiar with the technological possibilities, we have more to offer to our students, our colleagues, and the profession.

Thus, there are strong reasons for finding a place for technology in the LRW curriculum. Admittedly, the LRW curriculum may already have ambitious goals and the idea of adding to that curriculum may cause some to hesitate. Nonetheless, the technology options for the LRW curriculum are varied and plentiful. To whatever extent is feasible, technology belongs in the LRW curriculum.

²¹ For a discussion of the professional risks associated with involvement in technology projects, see Michael A. Geist, *Where Can You Go Today? The Computerization of Legal Education From Workbooks to the Web*, 11 HARV. J.L. & TECH. 141, 154-156 (1997). Another commentator states that there is a disincentive for faculty to become too involved in instructional technology:

We've found on our campus, for example, that the faculty who are generally the most receptive toward technology are the associate professors, because they don't have to worry about getting tenure . . . [and at another school] 'junior faculty work on instructional innovation at their peril.'

Albright, *supra* note 3.

²² The differences between doctrinal faculty and skills faculty are beyond the scope of this article. In my personal experience, however, my interest and use of educational technology has supplied a bridge to the doctrinal faculty that has led to an increase in collegiality among faculty.

III. REVIEWING TECHNOLOGY OPTIONS FOR THE LRW CURRICULUM

Once you have a rationale for using technology and understand how it can complement your pedagogical goals, the LRW teacher is ready to develop a strategy for integrating technology into the curriculum. Computer technology can be used in two general ways. First, technology can be used outside of regularly scheduled classes to enhance learning. Examples include the use of e-mail and course web sites. Second, technology can be used in the classroom to complement traditional teaching methods such as lecture and in-class exercises. Technology's use in the classroom may be limited depending on what technological resources are available. For that reason, out-of-class options are the surest way to begin integrating technology since almost all LRW teachers have access to an office computer and the Internet. However, as law schools continue to develop their computing infrastructures, in-class options will become increasingly possible.

A. *Technology Options that Extend the Classroom*

There are three general computer technologies that can enhance learning outside the law school classroom: 1) e-mail; 2) electronic assignments; and 3) web course pages. Each of these options can be offered at different degrees of sophistication and can be tailored to each LRW teacher's level of technical expertise.

1. *Use of e-mail in the LRW curriculum*

E-mail should be a part of every LRW curriculum. In a recent ABA survey of large law firms, 90% of the attorneys reported using e-mail within their legal practice.²³ As e-mail becomes more common in law practice, it is developing its own conventions and rules as another form of written communication. The ability to communicate effectively in writing is an essential skill that students learn in law school in their LRW course.²⁴ As part of that training, students should also be taught

²³ Large Firm Survey, *supra* note 10, at 3. While e-mail is used less frequently in small firms, its use throughout practice is expected to become as commonplace as the telephone and fax machine are today.

²⁴ See Garth & Martin, *supra* note 6, at 478 (finding that ninety-one percent of the respondents to the survey think that written communication skills can be taught effec-

to communicate effectively through e-mail. Just as LRW teachers assign memos, client letters, and briefs, they can also require their students to learn to use e-mail in a professional manner.

E-mail communication between students and their LRW teacher can be handled individually or through a class distribution list.²⁵ Once an e-mail communication channel is established, there are several ways to use it: as an extension of class discussion; as a bulletin board for announcements; and as a way to distribute and collect assignments. Make it clear to students at the beginning of the semester what kinds of information will be available through e-mail so they know what to expect.²⁶ Establish ground rules so students will know how often you will check your e-mail and how quickly they can expect a response.²⁷ Early in the semester use e-mail for a simple assignment to be sure that all students have properly functioning e-mail.²⁸ A straightforward e-mail exercise could include asking a student to prepare and then transmit a case brief or client letter. The use of e-mail in this context provides students with immediate online experience. After receiving the students' e-mailed exercise, provide an e-mail reply to increase student exposure to the technology.²⁹

tively in law school).

²⁵ In an e-mail distribution list, the LRW teacher can send an e-mail message to everyone in the class simultaneously. Check the help menu on the e-mail program your law school uses for directions on how to set up a distribution list. Technical issues involving set-up and policies for e-mail use within the law school setting are fully detailed in Professor Warner's recent article. See Warner et al., *supra* note 15, at 143-53 (excellent and complete review of e-mail).

²⁶ For example, I use e-mail for private communications with students and for collecting and distributing small, ungraded assignments. I use the threaded discussion list available on my TWEN web page for more public class discussions, and announcements. For an explanation of threaded discussion lists, see *infra* note 31.

²⁷ Additional "ground rules" for e-mail use can include rules concerning civility, anonymous posting, and whether e-mail messages will be posted in hard copy. Problems with civility are best handled individually with the offending student. Although I have not yet had this problem, another teacher in our program did have a problem with a student, which was handled this way. I also allow students the option of posting their messages anonymously on the threaded class discussion list. Anonymity encourages students to ask that seemingly "dumb" question. Finally, I do not provide paper copies of e-mail messages to students. I tell my students at the beginning of the semester that any class notices will only be distributed through the class e-mail list and then posted on the TWEN page. They are responsible for checking their e-mail on a daily basis.

²⁸ For your first e-mail exercise, avoid any assignment that requires students to attach documents. This is by far one of the most difficult e-mail tasks for students to accomplish; thus, it is better to avoid altogether the frustration that will undoubtedly ensue from this.

²⁹ E-mail programs allow you the option of repeating the message that you are re-

In using e-mail to communicate with students, “. . . make your own messages to students models of good online writing—timely, succinct, to the point, and respectful.”³⁰

When using e-mail to extend class discussion, encourage online discussion with a few focused introductory remarks such as repeating a question asked at the end of the last class. If using a threaded discussion list³¹ avoid jumping in too soon—excessive intervention may inhibit the opportunity for students to develop confidence in their own problem-solving abilities. Use e-mail distribution lists or threaded discussion lists as a way to answer commonly asked questions about assignments. This practice insures that everyone in the class gets the same answer at the same time.

For all these reasons, e-mail can be an excellent resource for communicating with your students. Contrary to popular belief, I did not find that it reduced the face-to-face contact with my students. Moreover, it enhanced communication by injecting an element of fairness, since student-teacher communication is more open when messages are shared through a distribution list. The use of e-mail also helped reduce the anxiety generated by the LRW assignment rumor mill. For example, I sent an e-mail to all my students when a question on the page limit had surfaced. With very little effort, e-mail provides students with another outlet to develop electronic communication skills, while adding to the smooth administration of the LRW class.

2. *Using electronic assignments in the LRW curriculum*

Distributing assignments electronically provides another opportunity to expose students to modern technology. It has the added benefit of making students recognize the shortcomings of electronic communication and that it is sometimes necessary to review information in hard copy.³² Since virtually all LRW as-

plying to. I choose this option so that I can comment on areas the student has done particularly well or that need improvement.

³⁰ See Diamond, *supra* note 18.

³¹ Unlike regular e-mail messages that appear within the list of incoming messages on your e-mail program, “threaded” discussion lists are accessed on the Internet at a pre-determined site. When students go to that site on the Internet, they see a chronological listing of subject lines from e-mail questions. Each question represents a “thread” of online discussion and is preserved on the site. The TWEN web sites offered by the West Group for law faculty include a threaded discussion list. For a description of TWEN, see *infra* note 46.

³² I noticed a very interesting phenomenon when I began distributing assignments

signments are created in electronic form, it is not difficult to distribute assignments that way.³³ The assignment can be created in *Word* or *WordPerfect*, in *FolioVIEWS*,³⁴ as a CALI exercise,³⁵ or in a web-based document. The assignment can be sent through e-mail, posted on the network or course web site, or handed out on a floppy disk.

Sending assignments out by e-mail, as mentioned earlier, is best reserved for small, ungraded projects. Some e-mail programs will not support very long messages or attachments. Moreover, if the students are to complete the assignment and return it as an e-mail message, it may not be anonymous, which may conflict with grading policies at some schools. Nonetheless, e-mail works very well for quick assignments such as case briefs or research exercises. It is possible to simulate the type of request students might get from an attorney if they were clerking at a law firm.³⁶

in an electronic format. The students still wanted to read a hard copy version of the assignment and therefore would quickly print out the assignments off the computer disk. This need for paper was particularly strong with respect to the cases and statutes provided as part of a "closed universe" assignment. The students' demand for paper generated an interesting discussion concerning the different reading patterns in print and online. See *infra* pp. 16-18 and note 40. Thus, even before my students had access to computer-assisted legal research, they were already sensitized to the challenges of online reading and the benefits of seeing documents in print. This phenomenon has also been noted elsewhere. See Ehrenberg, *supra* note 5, at 9-10.

³³ Because the print capabilities at our school are limited and students will soon be charged for printing, I distribute portions of many assignments in both electronic and print versions.

³⁴ Although once available through LEXIS-NEXIS, *FolioVIEWS* is no longer part of their software. "Due to the rapid migration of electronic publishing to web-based technology, LEXIS-NEXIS will no longer be providing *FolioVIEWS* software in our routine software distribution starting with the fall of 1998." Letter from Michael R. Conway of LEXIS-NEXIS to law school educators and administrators dated April 16, 1998. (copy on file with author) *FolioVIEWS* is still the leading platform for legal CD-ROMS and is still used extensively for electronic versions of law school texts. Materials created in *FolioVIEWS* are saved in a "bound" (self-executing) version so that the user is not required to have the *FolioVIEWS* software on her computer. Having used *FolioVIEWS* extensively, both for course supplements and for distributing closed assignments, I can attest that the program had a steep learning curve for my students and they much preferred a web-based delivery of assignments. For a more detailed description of *FolioVIEWS* and its capabilities, see Ehrenberg, *supra* note 5, at 9.

³⁵ The Center for Computer-Assisted Legal Instruction ("CALI") is dedicated to encouraging the use of computer-assisted legal instruction in law schools and provides a wide assortment of online legal tutorials for students at member schools. Although only a few of the tutorials offered are geared to the LRW curriculum, the exercises can offer students an optional way to reinforce concepts covered in class. See CALI: The Center for Computer-Assisted Legal Instruction home page (last visited June 16, 1998) <<http://www.cali.org>>.

³⁶ This is a new technique I will be trying this year. Throughout the school year, I

Posting the assignment on the law school network or a course web site has the advantage of always being available to the students. If they lose a copy of the assignment, they can easily get another. When the assignment is posted on a law school network, the LRW teacher can restrict access to the documents by distributing passwords so that students get only the appropriate information. This method of using passwords works well when an assignment involves confidential information for opposing sides such as moot court exercises.³⁷ If these type of security measures are not needed, assignments posted on an Internet web course page will be accessible to all students with an Internet connection. Students access the assignment through a web browser and can view, download, or print the files from the course web site.

Another method to distribute electronic assignments is to hand them out on disk. However, this is the most cumbersome method of distribution. The time and expense involved in making a disk for each student is greater than other methods of distribution.³⁸ Accordingly, course web sites are the easiest manner to distribute LRW assignments electronically.

In addition to the ease of distribution of electronic assignments, there are also pedagogical advantages as well. Hypothetical case files can be made more realistic by including a greater variety of documents such as correspondence, contracts or reports that might otherwise be too cumbersome to include in a hard copy version of the assignment. Eliminating paper costs makes it possible to include many more documents in the assignment.³⁹ Moreover, distributing assignments electronically helps students to learn firsthand the advantages and disadvantages of working in an online environment, particularly with respect to online reading and information retrieval.

will e-mail all my students at different times with simple requests for information that a senior partner might ask (for example, a complete cite to a case, a statute of limitations for a type of action, etc.). The purpose is to replicate the type of quick research requests students can expect in practice and build confidence in the students' ability to quickly and efficiently locate information.

³⁷ This password protection can also be included on web-based assignments, but is somewhat more complicated.

³⁸ I tried this method once and would never repeat it. Students lost disks, had trouble opening files, or copying it to their hard drives, and some students even suspected that the disk was an attempt to plant a virus on their computers.

³⁹ I always try to create assignments with a realistic "case file" that includes typical documents (correspondence, pleadings, etc.) and transcripts of witness interviews. Facts are not set out in chronological order, nor are extraneous facts excluded.

In our LRW program, the first major writing assignment, a closed universe memorandum, is distributed electronically on the class web site. The cases for the assignment are also distributed electronically, and students are at first quite pleased to have the legal materials available in this way. Soon, however, they are quickly printing out the materials, because they have come to recognize the inherent difficulties with reading online.

Reading online is not the same as reading a hard copy. When people read online, they tend not to read word by word, instead, they scan the page. In a recent study, 79% always scanned any new page—only 16% read word by word.⁴⁰ Thus, when students are reading unfamiliar text with abstract concepts and perhaps new forms of reasoning, scanning the material is not in their best interests and may have a negative effect on their comprehension. In addition, there are indications that people read at a significantly slower rate online.⁴¹ Students quickly realize that reading materials online first may be inefficient. Instead, they learn that when they read new and difficult material, they are better off reading the material in hard copy first. They learn that the characteristics of online reading, scanning pages and slower reading rates, are less of an encumbrance later in the analytical process when they are more familiar with the material. Later in the semester, when the students have access to CALR, they are already aware of its limitations when researching the law, and as a result, may become more efficient online readers. By offering assignments in both electronic and paper form, students may very well improve their ability to

⁴⁰ Jakob Nielsen, *How Users Read on the Web*, (October 1, 1997) <<http://www.useit.com/alertbox/9710a.html>>. For a discussion of online reading in the context of legal materials, see Bernard Hibbits, *Last Writes? Re-Assessing the Law Review in the Age of Cyberspace*, 71 N.Y.U.L. REV. 615, 676-77 (1996). How people read online and suggestions for how to improve writing that will be read online are growing areas of research. See Wendy R. Leibowitz, *Dealing With the Human Factor: Tech May Challenge Work Habits*, THE NATIONAL LAW JOURNAL, April 20, 1998, at B08, available at <<http://www.ljx.com/lawfirmmanagement/express/042098/human.htm>> (last visited April 20, 1998); Jakob Nielsen, *The Tyranny of the Page: Continued Lack of Decent Navigation Support in Version 4 Browsers*, (Alertbox November 1, 1997) <<http://www.useit.com/alertbox/9711a.html>>; Dale Dougherty, *Don't Forget to Write: Graphics May Get Attention but Good Writing Rewards It*, (last visited April 23, 1998) <<http://webreview.com/97/10/10/imho/index.html>>; and Jakob Nielsen, *Inverted Pyramids in Cyberspace*, (Alertbox June 1996) <<http://www.useit.com/alertbox/9606.html>> (excellent explanation of how to adapt writing techniques for more effective reader comprehension).

⁴¹ See Ehrenberg, *supra* note 5, at 7 (noting that text on a computer screen is read 20-30% more slowly on a computer screen than when read on paper).

work effectively in both mediums and, in the process, gain a better appreciation of when and how to read online.

Offering assignments in an electronic format also develops student skill in retrieving information online. Within the paper medium, students must search through piles of paper to locate specific information, such as a quote. In contrast, the search capabilities in an electronic environment allow for more efficient information retrieval. As more information is stored digitally, information retrieval skills will become increasingly important to the practice of law. Students should be taught to use the "find" command (CTRL-F) in any Windows-based program to locate information in a document.⁴² This basic technique has many applications while in law school, and even more so later in practice. Thus, in receiving assignments electronically, students can develop their online reading and information retrieval skills and become more comfortable working in an online environment.

3. *Using web course pages in the LRW curriculum*

Web-based technology⁴³ offers much promise for the LRW curriculum. Course web sites can be used to distribute traditional types of documents, such as syllabi, course descriptions, assignments, and model documents.⁴⁴ As technological improvements make it easier to create web-based materials and navi-

⁴² When the "find" command is activated, a dialogue box opens up and a word(s) can be entered. By clicking "OK" the Windows program will search the document for every place where the word(s) appear and highlights those words in the text. Although not as sophisticated as the query capability in *Folio VIEWS* or the search options in *LEXIS* or *Westlaw*, the "find" command is nonetheless an effective retrieval technique. It can also be used when viewing a web site.

⁴³ The World Wide Web (the "Web") is really only a portion of the Internet. The Internet encompasses all electronic information that can be shared between computers over phone lines. Specific types of information on the Internet are then sub-classified according to the technological language it is written in. Information included on the Web uses HyperText Markup Language (HTML). When documents are created in HTML, they include Hypertext "links." These links appear as underlined text or graphics on a web site that can be opened when clicked on with a mouse. One of the key advantages of HTML is that people using a web browser, like Netscape or Internet Explorer, can view the pages, no matter what kind of word processing or operating system they have on their computers. Other types of information available on the Internet use different techniques to access the information, such as "telnet" and "gopher." See Geist, *supra* note 21, at 158 n.99.

⁴⁴ An excellent source for any law faculty contemplating a web site is *JURIST: The Law Professor's Network* (last visited October 2, 1998) <<http://jurist.law.pitt.edu>>. This web site includes links to faculty web sites, authoring tools, and other useful information about the Internet for law faculty.

gate the Internet, the possibilities for its use as a teaching tool are only limited by your imagination.⁴⁵

Although originally the most daunting way to integrate technology into an LRW class, course web pages have become increasingly easier to create and maintain. Generally, the LRW teacher has two options in developing a web site: she can create her own web site or use one of the ready-made products available from West (TWEN)⁴⁶ or LEXIS (Virtual Classroom).⁴⁷ Although creating your own web site allows more flexibility, the ease of the ready-made web course products is hard to beat.

Creating your own course web site is a two step process:⁴⁸ 1) you must first create the documents in HTML⁴⁹ files; and 2) then load those files on your web site on the server (sometimes referred to as the remote computer). Any documents included in the web site must be created in HTML, the programming "language" of the web. The latest versions of *Word* and *WordPerfect* allow you to save your documents in an HTML format, thus eliminating the need to learn the HTML language. However, formatting changes may occur or be lost in the transformation and may be difficult to fix without knowing HTML. There are also web publishing tools available in the Netscape browser and

⁴⁵ Michael Geist has been a key innovator in the use of web-based technology in the LRW curriculum. His 1997 course web site can still be viewed at <<http://www.columbia.edu/~mag76/lrw.html>> (last visited November 13, 1998). His most recent article further describes the current state of web-based technology in legal education. See Geist, *supra* note 21.

⁴⁶ The West Educational Network (TWEN) is a Web-based platform designed to help professors extend their classrooms electronically. With TWEN, law faculty can have threaded online discussions with their students, post class materials, and link to Westlaw, CALI, and other online materials on the Internet. For more information about TWEN, visit the web site at <<http://www.twen.com>>.

⁴⁷ LEXIS-NEXIS Xchange offers the "Virtual Classroom" to law faculty. The Virtual Classroom is a web-based template that allows faculty to quickly create a class web site by filling in an online form. The LEXIS Virtual Classroom is free to law faculty and students and includes a threaded discussion list and the ability to post class materials and schedules. For more information about the Virtual Classroom, visit the web site at <<http://www.lexis.com/lawschool>>.

⁴⁸ Explicit directions on how to create a web site are beyond the scope of this article. Instead, a brief overview is included here so that readers can decide for themselves if it is worth pursuing for their own courses. The JURIST web site has many links to web authoring tools and is an excellent resource for law faculty interested in creating their own web sites. See JURIST, *supra* note 44.

⁴⁹ See *supra* note 43. There are many sources on the Internet that also explain HTML. One of the better guides is offered by the National Council for Supercomputing Applications. A *Beginner's Guide to HTML* (last visited on October 2, 1998) <<http://www.ncsa.uiuc.edu/General/Internet/WWW/HTMLPrimer.html>>.

web publishing software programs such as Hot Dog Pro.⁵⁰

Once documents are created in HTML, they must be transferred to the web site you plan to create. This process involves the use of FTP (file transfer protocol).⁵¹ There are fairly easy programs that will complete the process for you or, if you have a law school "webmaster," she can load the disk containing your documents onto the web site for you.

Maintaining your own course web site has both advantages and disadvantages. A web site offers twenty-four hour accessibility for students. As a result, students have no excuse for losing an assignment or handout. A web site, however, also requires constant maintenance by the LRW faculty. You must be prepared to keep it up-to-date; you cannot just create a web site and forget about it. Good web design⁵² also takes time and thought and not everyone has the knack for it. For those people who do not, the ready-made web sites are a better option.

Both LEXIS and West now offer ready-made web course packages.⁵³ An LRW professor can create a web site with these products by filling out some online forms that ask the professor's name, the name of the course, when it meets, and how many students are enrolled in the class. Once the web site is established, course materials can easily be transferred to the site from a disk or your computer's hard drive. Be aware, however, that some formatting changes may occur when the documents are viewed through a web browser.

Both products appear to be quite similar, although the one from LEXIS is free. Another difference is that West's TWEN in-

⁵⁰ To find out more about Hot Dog Pro, see the web site at <<http://www.sausage.com>>. If you would rather use a Microsoft product, its web publishing program is called FrontPage'98. Information about this software can be found at <<http://www.microsoft.com/frontpage>>.

⁵¹ FTP (file transfer protocol) is the process of moving or transmitting a file from one computer to another over the Internet. Typically a computer user will need FTP software to move the file from the computer's hard drive to the Internet site. This process is sometimes referred to as "uploading." See MICROSOFT PRESS COMPUTER DICTIONARY 357 (1991).

⁵² One example of a well-designed LRW web site is that of Professor Gregory Berry at Howard University Law School. His web site can be viewed at <<http://www.law.howard.edu/~gberry/lrrw>>. Professor Berry's web site offers more than just a syllabus; it includes helpful writing tips ("Berry Advice") and information regarding returned assignments such as the grading criteria, a sample answer, and grade distribution. Professor Berry conceived and created the web site himself using Netscape Composer and HotDog Pro. He also loads the pages himself using basic FTP software (CuteFTP).

⁵³ See *supra* notes 46, 47.

cludes a link to Westlaw on the TWEN web site while the Lexis *Virtual Classroom* does not, at this writing, include a link to its own research database, LEXIS. Either product can be easily integrated into the LRW curriculum. Since these ready-made web sites are hosted by West and LEXIS respectively (the web sites reside on their servers), it is therefore unnecessary to coordinate these web sites with your law school network.

The main advantage of a ready-made web site is the ease of setup and maintenance. Very little technical or Internet expertise is necessary to maintain them. The chief drawback, however, to the ready-made web sites is their lack of flexibility. For example, the TWEN site does not allow a faculty to personalize a web site by tailoring the graphics or fonts to your individual tastes and needs. Because of that, all TWEN web sites look virtually the same. Nonetheless, for busy LRW professionals, either TWEN or the *Virtual Classroom* is a welcome option. Moreover, my students' experience with the TWEN page has been positive. Students can view, download, or print materials available on the TWEN page. Although initially some of my students had problems getting registered for TWEN, once they did, they reported that the materials were easy to use.⁵⁴ They especially liked the threaded discussion list.

Any of these out-of-class options, e-mail communications, electronic exercises, or course web sites are fairly easy to implement. They all provide students with an opportunity to work in an electronic environment. In the process, students develop on-line communication skills as well as the ability to retrieve information electronically while they fulfill the requirements of their LRW class.

B. *Using Technology in the LRW Classroom*

Implementing technology in the classroom is admittedly more difficult than using it outside the classroom. Besides the cost, there may be logistical problems that make it impractical. The entire faculty must usually compete for limited technologi-

⁵⁴ The registration process confused some students because different passwords were needed and they tended to use the wrong ones. For example, students must use their West password to first register with TWEN. During the registration process, students are then asked to create a new password to use whenever they access TWEN. In addition, each course that uses a TWEN page (our LRW and Property classes both use TWEN) must employ a third password that is only used once, when you first register with the web site for that class.

cal resources within a law school. In many ways, however, the LRW curriculum with its typically small class size and focus on skills, offers an ideal setting for the use of instructional technology. In this section, I suggest ways to use technology in the LRW classroom. My suggestions are based on my experiences in Keller Hall, the new state-of-the-art building which is now home to the University of Dayton School of Law. However, many of the methods described here can be implemented on a smaller scale or serve as inspiration to improve the technological resources available at other law schools.

All classrooms in Keller Hall are wired for access to the law school network and the Internet. There are data ports⁵⁵ at all seats in the classrooms, the library, and lounges where students can plug in their computers. Each of the classrooms, other than the seminar rooms, contains a lectern equipped with a networked computer and VCR, a ceiling mounted LCD projector, a document camera, video-taping capabilities, and enhanced audio for hearing disabled students. The seminar rooms have network connections in the floor, rather than wired in the desktops, to accommodate different seating configurations. A portable LCD projector and computer are also available in those rooms.⁵⁶

Generally, I prefer to use classrooms in which the technological resources are permanent fixtures because the equipment proved more reliable.⁵⁷ My preference for classrooms with built-in technology underscores its main drawback; unless the technology works flawlessly, which it often does not, you have to have a backup plan. When the technology worked, I was quite pleased with how engaged the students became in the class. But when the technology did not work, it was a humbling experience, and not everyone may want, or have the time, to risk this type of disruption.⁵⁸

⁵⁵ A "data port" is a connection plug-in that resembles the plug-in used for a telephone line.

⁵⁶ Each LRW professor meets with her students in small sections of 15-20 students twice a week and once a week in a larger section of 45-50 students. The seminar rooms are used for the smaller sections.

⁵⁷ With "portable technology" (such as a computer and projector on a rolling cart) I would often find that the "tech cart" had not been returned by the last user (creating last minute searches) or had been returned with a problem that had not been fixed. This year, I have my small sections assigned to a seminar room that is equipped with a "SmartBoard," an interactive electronic whiteboard described *infra* text accompanying note 62.

⁵⁸ Even when things did not work, I used it as an opportunity to hone problem-solving skills. My students often had great suggestions to make things work or, better

During class, I experienced the most success with the document camera, the large screen projection, and the computer lab. The document camera allowed the flexibility to display documents and texts without having to create a transparency beforehand. With the large screen projection, my students did several editing exercises and participated in designing and implementing an online legal research strategy. In the computer lab, my students honed their drafting skills. To the extent any of these resources are available to your LRW program, there are many ways they can advance your pedagogical goals.

1. *The Document Camera*

The document camera (ELMO)⁵⁹ looks like an overhead projector. Unlike a typical overhead projector, however, ELMO displays an image of whatever is placed on it. Whether you place a transparency, a piece of paper, or even your hand on the ELMO, the image is captured and then displayed on a screen via an LCD projector. Although its set-up is somewhat high tech,⁶⁰ its classroom use is easy. Merely turn it on. The image can be zoomed in or out to make it more legible. The document camera earned high marks for reliability because it worked every time.

There were many ways to use this device in class. I displayed handouts or student work without having to first create a transparency or put the document in an electronic form. The document could be written on, or pointed to, just like a transparency on an overhead projector. The document camera made it easy to conduct in-class editing or citation exercises. The document camera could also be successfully used to teach manual research. For example, I often used it for live demonstrations showing how to use legal research sources such as Shepard's and the West Digest System. For our research classes, I brought in the library books students were learning to use, such as Shepard's. For the class hour, I asked students to Shepardize a case using the document camera so that everyone in class could follow the process. By displaying the actual book, rather than

yet, found other ways to accomplish the day's goals.

⁵⁹ The document cameras in Keller Hall are ELMO's, model EV700AF. For more information about ELMO's, visit their web site at <http://www.m-media.com/elmo_prod.html>.

⁶⁰ Unlike the overhead projector that only requires an electrical outlet, the ELMO requires a cable connection between it and a device that transmits the image to the LCD projector.

pages copied from Shepard's, students got a better sense of how information in Shepard's is organized. With the zoom-in capabilities of the document camera, everyone could see the small notations and different abbreviations students encounter while Shepardizing.

In another research exercise, I brought in the general index volumes for *American Jurisprudence 2d* and asked a student to locate information relevant to the topic we were researching in class. As the student looked up search terms in the index, the books were placed on the document camera so that everyone in the class could follow the student's research trail. As the student looked up search words in the general index, the entire process—including the "blind alleys" and mistakes—was visible to everyone in the class. It was much more effective than an abstract lecture on legal research. Later, the students went to the library to complete their research exercises. They remarked that seeing how the different books were used in class with the ELMO provided a helpful introduction to the materials. The only disadvantage I have found with the document camera is that it may be hard to read when the print on the document is very small or blurred.

2. LCD projection

The LCD projector allows you to project on a large screen images from a laptop computer. Most LCD projectors are portable (resembling the vintage home movie projectors) or mounted in the ceiling of the classroom.⁶¹ The mounted LCD projectors are usually located in larger classrooms (those that seat 50–100 students) and project onto a screen. A portable projector is better suited for smaller seminar rooms that seat less than fifty. While it is preferable to have a screen to display the images, a blank wall is acceptable, too.

Another projection alternative for a smaller classroom is a

⁶¹ The simplest LCD display is a thin panel with a cable connecting it to a separate computer monitor. The panel sits on top of a traditional overhead projector so that whatever is on the computer screen can be displayed by the projector. Unfortunately, the display quality is usually poor. As a result, the portable LCD projectors and the permanently mounted LCD projectors are becoming more common. I have used all three versions of LCD display and would recommend the portable projector. Although it certainly is not as easy to use as the mounted projector, the ability to transport it between classrooms is an advantage. For a more comprehensive review of LCD projection, see Warner et al., *supra* note 15, at 113-124.

SmartBoard.⁶² A SmartBoard is an interactive electronic whiteboard (similar to a chalkboard, only it is white and uses colored markers) that comes in a variety of sizes. The SmartBoard we have in the seminar room at Keller Hall has a touch sensitive screen surface of approximately three feet by four feet and resembles a big screen television. By projecting computer images onto the SmartBoard, you can control all Windows and Macintosh applications by using a mouse or touching the screen. For example, to close a program on the screen you can either use the mouse to position the cursor over the top right-hand "x" and click or you can simply touch the same spot on the screen. In addition, just like a chalkboard, you can make notes or highlight text on the SmartBoard in electronic "ink" that can be erased. I appreciated the projection capabilities of the SmartBoard as an alternative to the LCD projector for a small classroom. Since it is a fixed piece of equipment, I can always count on it being in the classroom and ready to go.

I have used the SmartBoard and LCD projection for *PowerPoint*⁶³ presentations, for critical reading and editing exercises, to show videotapes of client interviews and oral arguments, and to teach computer-assisted legal research. As for its reliability, the LCD projector was sometimes the most troublesome. If you are planning to use an LCD projector, particularly a portable one, be aware that it may be incompatible with the computer you are using. This is usually because the LCD projector will not work until the display settings on the computer are changed. Once that problem is resolved, the projector is very reliable.

When introducing discrete skills, like Bluebook citation or designing a research strategy, a *PowerPoint* presentation can be an effective way to present the material. Presentation software offers an organized way to present new topics or an overview of material to be covered in class.⁶⁴ For example, I have used pres-

⁶² For more information about SmartBoards and their uses, visit their web site at <<http://www.smartboard.co.uk/product/classroom.html>>.

⁶³ *PowerPoint* is part of the Microsoft Office bundle of software. The *WordPerfect* counterpart is *Presentations*. I have used both *PowerPoint* and *Presentations* and have consistently found *PowerPoint* easier to use. At the 1998 Legal Writing Institute Conference, Professor Darby Dickerson provided excellent advice on creating *PowerPoint* presentations. You may be able to obtain her materials by contacting her at: darby@hermes.law.stetson.edu.

⁶⁴ Presentation software allows you to create, view, and project slide shows from a computer. The slides can include text, images, graphics, video clips, sound, and documents from other applications, including links to an Internet browser.

entation software to explain the citation rules for case cites, with an explanation provided for each major part of the case cite (the case name, which reporter to cite, the jurisdiction and year). The main drawback of this technology, however, is that students tend to be passive observers,⁶⁵ rather than engage in a learning experience. There is also a tendency for the teacher to put too much text in the presentation resulting in the unsatisfactory phenomenon of students following along as the teacher reads the materials out loud.⁶⁶ The more interactive a presentation can become, the easier it is to avoid this problem.

The newer versions of *PowerPoint* allow you to make presentations more interactive. For example, I began an exercise on citation form by displaying a series of screens that explained the rules concerning proper Bluebook form for case names. Next, I displayed a screen showing the word "example." When I clicked on the word "example," a *Word* document appeared on the screen with an unedited case name. A student was then called to the computer and asked to enter the correct case name. The class then had an opportunity to discuss the student's answer.⁶⁷ When that skill had been sufficiently introduced, it was easy to return to the *Power Point* presentation for the next point, such as parallel cites. The more presentation software can be used in an interactive manner, the more effective it becomes in the LRW curriculum.⁶⁸

LCD projection can also be used effectively for drafting and editing exercises. Text can be displayed providing an opportunity for an in-class writing exercise. I often have my students work in groups during class, drafting a "Question Presented," a thesis paragraph, or a particular legal document, such as a complaint. Students without laptop computers in class, write out their drafts on paper. When they are done, they type in their

⁶⁵ See Nancy Page Fernandez, *Technology & Learning* (last modified August 1997) <<http://www.georgetown.edu/crossroads/guide/fernan.html>> (noting that presentation design can lull students into passive observers).

⁶⁶ *Id.*

⁶⁷ I strongly recommend that if you use technology in the classroom, you use it to engage the students. Otherwise, you may find yourself with a passive group of onlookers. The focus shifts to your technical expertise, or lack of it, instead of the material. I found that when I involved students in class presentations, they learned better.

⁶⁸ I also use presentation software in an interactive way when I teach a class on Internet research strategies. For example, the presentation covers techniques for using general search engines. Then, within the presentation there are hypertext links to general search engines such as *Infoseek* and *Alta Vista*. Therefore, first the technique is described, and then it can be demonstrated in a seamless presentation.

draft on the classroom computer. Students with laptops save their drafts on a disk and then transfer the file to the classroom computer. Students can view and compare each draft as they are displayed by the LCD projector through the classroom computer. By participating in this exercise, students see the importance of revising a document to produce a high quality product. They also see the variety of ways their classmates chose to effectively communicate the same idea.

I have also used LCD projection to develop critical reading skills. I display a short case or statute and call on a student to read the passage aloud. I also ask the student to explain what she is thinking as she reads.⁶⁹ Because the entire class is focused on the language of the case or statute, students can test their own understanding of the same passage. This exercise also allows me to quickly focus student attention on specific language without wasting class time trying to explain where in the document the language is found.

Besides assisting in reading comprehension, LCD projection can also help develop analytical skills since “[d]isplaying appropriate passages at crucial points help students do what they often have difficulty doing on their own: focusing on the relevant language in the materials they read.”⁷⁰ Using the SmartBoard,⁷¹ I ask a student to highlight the text as he reads it, just as he would highlight the text if he were reading the case in paper. When the student is finished, I ask him why he highlighted the passages he chose. This technique helps students recognize that in their search for the “Black-letter law,” they often miss other crucial parts of a case, like the facts, or the court’s reasoning.

Finally, I often use LCD projection to teach computer-assisted legal research. Although we still invite the vendors to train students on their respective products, I also include clas-

⁶⁹ This exercise is based on an article by Elizabeth Fajans and Mary Falk describing a reading protocol, a strategy for reading legal text. See Elizabeth Fajans & Mary Falk, *Against the Tyranny of Paraphrase: Talking Back to Texts*, 78 CORNELL L. REV. 163, 191-198 (1993). See also Peter Dewitz, *Reading Law: Three Suggestions for Legal Education*, 27 U. TOL. L. REV. 657 (1996). Using the strategy described in the Dewitz article, I first model what I expect the students to do. As I read a displayed text, I indicate how I search for context and explain what I am reading. Then, I display a different text for a student to read. As the student reads the text aloud, she provides commentary on what she is reading. For example, the student may say, “I’m skipping to the end to see how the court ruled and then coming back to the beginning of the opinion.” When she is finished, students discuss the effectiveness of the reading techniques they observed.

⁷⁰ See Warner et al., *supra* note 15, at 113.

⁷¹ Described *supra* in text accompanying note 62.

ses on computer research within my own curriculum.⁷² With a network connection, classes can include LEXIS, Westlaw, and Internet research. The main drawback is that it is often difficult to read the text in some of the projected computer images. The text can be enlarged somewhat,⁷³ but since you have no control over how information on the screen is formatted (for example, the size of the font in the document you are viewing), there are nevertheless limitations. If students have network connections at their seats, this problem can be overcome by having them follow along with you on their own laptops.

In general, when using LCD projection in the classroom, readability concerns are the main technical issue.⁷⁴ Whenever possible, use a sufficiently large font: 18 to 24 point type can be read at the back of a typical 100 seat classroom.⁷⁵ Choose colors that are easy on the eyes. When lighting is less than optimal, white text on blue background works well. However, red on white is hard to read.⁷⁶ The type of font you use also makes a difference. Use a *sans serif* typeface (Arial works well), instead of more commonly used fonts like Times Roman or Courier. Using LCD projection can be simple or elaborate depending on your pedagogical needs or goals. And it is important to keep these goals in mind when you plan your use of the LCD projector.

3. Computer labs

Although not technically a classroom tool (since computer labs are rarely designated as a "classroom" in the law school), I reserve our computer lab during class time for "hands-on" collaborative drafting and research exercises. When I was in a building with a smaller computer lab, students worked together at each station, which was also quite successful. The class met

⁷² Professor Marilyn Walter advocates the importance of involving the LRW professor in teaching computer research because trainers provided by the commercial vendors may be less motivated to teach a comprehensive approach to research strategy that includes the use of hard copy sources when appropriate. See Walter, *supra* note 20, at 582-86.

⁷³ On the menu bar in the web browser (either Netscape or Internet Explorer), choose "View" and select an option to "zoom" or "enlarge text." Unfortunately, the text enlargement feature has limits and may not enlarge enough so that everyone in the class can read the screen.

⁷⁴ A complete review of the technical issues associated with LCD projection is found in Warner et al., *supra* note 15, at 113-124.

⁷⁵ *Id.* at 114.

⁷⁶ *Id.* at 124.

in the computer lab to draft client letters or demand letters to opposing counsel. As the students worked on their letters, they were encouraged to collaborate. During the hands-on research classes, collaboration was much more common as students compared research strategies and results. The final product (whether a client letter or list of research authorities) was printed out at the end of class, or e-mailed to the LRW professor for review. The only drawback is that it is sometimes difficult to reserve the computer lab because of heavy use by others within the law school community. You should especially avoid reserving the lab during peak demand times, like right before a major writing assignment is due. To the extent the computer lab is available, however, it can be a relatively easy way to include technology in the LRW curriculum.

Like the computer lab, the ability to use technology in the LRW curriculum depends on its availability. However, the more we understand how technology furthers our pedagogical goals, and how to effectively use technology in the LRW curriculum, the better prepared we are to assess the technological capabilities within our facilities. We can know how to use the resources we have and how to make cogent arguments to get the technological resources we need.

IV. INSTITUTIONAL & OTHER CONSTRAINTS ON THE USE OF TECHNOLOGY IN THE LRW CURRICULUM

While the use of technology may benefit our students and offer creative ways to enhance the LRW curriculum, inadequate law school facilities may pose a significant obstacle. The use of technology depends upon our law school's infrastructure, including the computing facilities, the law school network, and student computing capabilities. Deficiencies in any of these areas may limit your ability to integrate technology into the classroom. As one commentator noted: "To keep our sanity and that of our students, we have to balance what we would like to do with what is practical."⁷⁷

A. *Law School Computing Facilities*

If the tenor of messages posted on law school computing discussion lists is any indication,⁷⁸ many law schools are at some

⁷⁷ See Diamond, *supra* note 18.

⁷⁸ Discussion lists especially dedicated to law school computing issues include "E-

stage of upgrading or evaluating their computing facilities. Not only can LRW faculty make more effective use of the law school's existing facilities, but we can also become involved in planning future improvements in the computing facilities. In examining what technological resources you have and what you need, focus your efforts on the faculty office, the classroom, and the computer lab.

Within the faculty office, LRW faculty members need computers able to do the basic tasks they expect from their students. Their office computer must have access to LEXIS, Westlaw, and the Internet.⁷⁹ The computer must have at least one Windows-based⁸⁰ word processing program (*Word* or *WordPerfect*) and presentation software⁸¹ (such as *PowerPoint*). Preferably, the office computer should have the most current word processing programs available so that student assignments can be turned in on disk and graded on computer.⁸² It may also be worth checking whether the law school could supply you with a notebook computer in lieu of a desktop model. With a

Teach" and "Teknoids." Information on how to subscribe to these lists and others is described in the Law List, maintained by Lyonette Louis-Jacques at the University of Chicago Law School. A searchable index to this list is available on the Internet at <http://www.lib.uchicago.edu/cgi-bin/law-lists>.

⁷⁹ Both LEXIS and Westlaw are now available via the Internet. While this reduces the need to have proprietary software on your computer, it does require you to have a computer with enough "muscle" to handle the multimedia capabilities of the Internet. Recommendations regarding the computer capabilities you will need are available in computing magazines, such as *PC WORLD*, or by checking the reviews and recommendations on *CNET: The Computer Network* <<http://www.cnet.com>>, a comprehensive site on issues related to computing and the Internet.

⁸⁰ If the experiences of my faculty are any indication of what others may experience, it may be very difficult for some to abandon the WordPerfect "blue screen" found in earlier DOS-based versions. Nonetheless, there are compelling reasons for making the jump to a Windows-based program. An increasing number of key programs, such as e-mail, are now Windows-based. Besides being better able to communicate with your students, it will be much easier for you to create documents that can transfer easily to the World Wide Web.

⁸¹ See *supra* note 63.

⁸² I provide my students with the option of turning in their assignments on disk. I require all my students to hand in two copies of their assignment. If one copy is on disk, the other must be a paper copy. Out of my 45-50 students, only about five to ten use the disk option. As I grade the memos, I read through the hard copy and type the comments on the disk. I use this technique for two reasons. First, I believe I read differently online than on paper, and I want to be consistent in my grading. For a discussion of online reading see *supra* text accompanying note 40. Second, large-scale structure and other aspects of the memo are more apparent in print than online. I find that typing the comments on the students' disks takes no more time than hand-written comments. My comments are much more legible this way, and students that use this option say that they find this form of feedback much more helpful.

notebook, LRW faculty have increased portability for creating and grading assignments. Your work is not tied to your desk, and there is no need to shift files between a home and office computer. Notebook computers offer an additional advantage when LCD projectors are available because they can also be used in the classroom to display documents, exercises, or other presentations. While obtaining a more powerful computer may mean learning new word processing software or developing facility with the Internet, it is time well-spent.

Although an adequate office computer can increase the technological options for LRW teachers, a well-equipped classroom can even further the possibilities. Unfortunately, technological upgrades in the classroom may be more difficult to overcome than deficiencies in office computing facilities. Technological improvements in the classroom often face financial constraints as educational budgets get tighter. In addition, physical constraints often exist in older facilities.⁸³ As you review your own law school's technological infrastructure, you may find that some institutional limitations are insurmountable. Even then, there are still ways that technology can find its way into the LRW curriculum.

Even under the most difficult of circumstances, a classroom can have at a minimum an overhead projector.⁸⁴ More sophisticated projection capabilities are possible in the classroom if you have access to a computer and LCD projection. The computer can either be a notebook or a fixed computer. Along with the computer, the classroom needs an LCD projector that can display the computer screen.⁸⁵ As discussed earlier, you can display whatever you can create on your computer, whether it is a sin-

⁸³ See Richard Perna & Lindy Carll, *Interim Report of the University of Dayton School of Law Mead Data Central Joint Committee to Study Computer Technology in Legal Education* (last modified 1993) <http://www.law.cornell.edu/mdc_udsl/sect3e.html> (noting the economic constraints law schools face as they try to upgrade technology). See also Marcia Carlson et al., *Beyond the ABCs*, AM. SCH. & U., January 1, 1997, at 14 (school administrators examine how educational facilities are changing and the challenges involved in facing those changes). In light of these potential obstacles, it becomes even more important that technology expenditures have a pedagogical justification.

⁸⁴ At the Ann Arbor LWI conference, see *supra* note 1, my co-panelist, Professor Nancy Soonpaa, described many innovative ways an overhead projector can be used in the LRW classroom. For many professors, the overhead projector is a low-tech, but readily available piece of equipment in the classroom. Instead of traditional overhead projectors, most of our classrooms at the University of Dayton School of Law are equipped with document cameras, which can display traditional transparencies as well as regular print documents. See *supra* section B1.

⁸⁵ See *supra* section B2.

gle document or an entire multimedia presentation. If you have a network connection in the classroom, you can also display any network accessible information, such as Internet materials.

Most law schools are in the process of developing a local area network (LAN) if they do not already have one. Through a LAN, network users have access to the Internet, e-mail, and whatever programs or files are available on their server.⁸⁶ In planning to integrate technology options such as e-mail or discussion lists, the network capabilities must be able to support these options.

The accessibility of your law school's network may affect to what extent you can use technology. A LAN network can only be accessed through data ports.⁸⁷ At a minimum, law schools should provide data ports in every faculty member's office. For pedagogical reasons, other access points should exist throughout the building, including the classrooms, library, and computer lab. Classrooms may have one data port, which only permits the instructor to access the network. Or, the entire room may be wired so that every student has access to a data port. The availability of data ports impacts how the network can be incorporated into your curriculum. Generally, fewer data ports in the classroom limit your ability to conduct "hands on" exercises using the network. In addition, dial-in access should be available so that students and faculty can access the network from home. Home access may be limited to just e-mail or it can include full access to the Internet and server files.

Networked computers available for student use are usually located in the law school library.⁸⁸ In some instances there may be a computer lab with several networked computers. If a lab is available, check out how many computers are in the lab, what software is available on those computers and the hours the lab is open.⁸⁹ As described earlier, the lab can be reserved for

⁸⁶ The "server" is the main computer that controls access to the network and its resources. See MICROSOFT PRESS COMPUTER DICTIONARY 314 (1991). All computers connected to the network have access to whatever is stored on the server. See *Id.* In some cases, faculty and students may have the ability to save files on the server. If the classroom has a network connection, this can allow you to access files from your directory and project them in the classroom.

⁸⁷ See *supra* note 55.

⁸⁸ If the law school is affiliated with an undergraduate institution there may be computer centers available for student use at the other facilities. However, these computer centers may not always have access to the law school network.

⁸⁹ For example, look for Internet access and what word processing is available. Find out whether CALI exercises can be accessed on the lab computers and whether the com-

hands-on workshops on computer-assisted legal research or legal writing.⁹⁰

B. *Student Computing Capabilities*

Finally, in addition to the availability of computing facilities at the law school, it is also helpful to know what type of computing abilities the students possess. What programs are they familiar with? What is their level of expertise? The answers to these questions provide not only insight into your students' comfort level with technology, but also alerts you to their expectations for its use in the classroom. I distribute a short survey⁹¹ during orientation and then again at the end of the first year that asks how many of the students own their own computers, how many of them are notebooks and how long they have had them.⁹² The survey helps plan any computer training that may be necessary as well as determining whether assignments requiring the use of a computer are feasible. Several years ago, I avoided assignments that required computers because the results of my survey indicated that the computer lab could not accommodate all the students who did not have computers. The most recent survey results indicate a significant increase in computer ownership. At present, approximately 85% of University of Dayton School of Law students arriving at law school now own a computer.

Even though law students appear to be more computer literate with each new year, be careful not to over-estimate their proficiency. Although our surveys indicated that students felt confident in their computing expertise, the number of students who have trouble, for example, correctly saving a document still surprises us. For that reason, students should be encouraged to attend any available computer training offered by the law school.⁹³ By assessing the students' level of computer sophistica-

puters have the capability to do CD-ROM research. Know what is available for your students.

⁹⁰ See *supra* section B3.

⁹¹ If you would like a copy of the survey, e-mail me at crist@udayton.edu.

⁹² Many law schools are beginning to require computers of entering students. See James E. Duggan, *Mandating Computer Ownership at Law Schools: A Survey*, (last modified Feb. 13, 1998) <<http://www.siu.edu/offices/lawlib/survey.htm>>. This requirement is currently under consideration at the University of Dayton School of Law.

⁹³ Our LRW curriculum has no time to include basic computer training. Instead, it is offered by the computing support personnel who are separate from the LRW program. Although training sessions are normally conducted by the computing support staff mem-

tion, you can avoid making unrealistic demands, such as expecting them to use a sophisticated program to complete your assignments.⁹⁴

IV. CONCLUSION

While there are certainly compelling reasons to integrate technology into the LRW curriculum, there are equally significant cautions. In the article *Teaching Law with Computers*, the authors offer a useful checklist for law faculty considering the implementation of technology in their classes:⁹⁵

- Have you developed a clear pedagogical rationale for using the technology?
- Have you made that rationale clear to yourself and your students?
- Have you integrated the technology into an overall pedagogical plan in a way that keeps the focus on your teaching goals and avoids "information overload"?
- Can you use and rely on the technology to the point where it does not become a distraction?
- Is the technology sufficiently reliable so that it promises to be relatively trouble-free in the classroom? If it does fail, do you have a backup plan?
- Do you have an adequate computing environment, including a well-equipped computer, a reliable computer network, and computing support staff willing and able to work with you?

After considering the answers to these questions, you will be in a better position to evaluate how to effectively integrate technology in your LRW curriculum.

Information technology in its many forms will be an increasingly integral part of legal education and the practice of law. The more we can expose our students to the capabilities, as well as the limits of technology, the better prepared they will be to effectively integrate technology in their professional careers.

bers, I have found that they appreciate receiving input from the LRW faculty concerning the type of computing tasks we expect our students to perform. This information enables the computing personnel to design training sessions tailored to the LRW curriculum and anticipate questions they may receive in the lab.

⁹⁴ I learned this the hard way when I expected my students to use *FolioVIEWS* to read and use my class supplementary materials. See *supra* note 8. The program had a steep learning curve and caused unnecessary frustration among my students.

⁹⁵ See Warner et al., *supra* note 15, at 171. I have adapted the checklist for the needs of LRW faculty.