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**Using “Hi-Tech” Tools In A Traditional Classroom
Environment — A Two Semester Experiment**

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Introduction

The most amazing thing is that we are all using computers, learning, and trying but the majority of us are not computer geeks. We are a group that is willing to learn and help.¹

Whether we like it or not, technology has become an integral part of our lives and affects virtually every aspect of the legal profession — from the solo practitioner in northern Minnesota to the partner in a 400-person Wall Street firm. Technology has transformed how lawyers communicate, manage files, present cases to juries, and handle their professional and personal activities. It has been warmly received by the practicing bar.

In contrast, technology has received, at best, a chilly reception from most faculty and administrators within the legal academy.² While the precise number of faculty who are taking advantage of technology that is now available to them in newly constructed or renovated “hi-tech” classrooms is unknown, one suspects that it is small.

The purpose of this paper is twofold: first, to share the strategies, techniques and outcomes of a one-year “hi-tech” educational experiment³ conducted by the author and three of his colleagues with fifty-five volunteer first-year law students at William Mitchell College of Law during the 2001-02 school year;⁴ and second, to encourage further in-depth law school experimentation with “hi-tech” tools and techniques.

The team assembled for this experiment sought to assess the educational efficacy of using technology in a first-year section of students taking courses in civil procedure, contracts, property and torts.⁵ All of the students were required to supply their own laptop computer, and each computer was equipped with a wireless transmitter provided by the

college at its expense. All classes were held in a “hi-tech” law school classroom specifically reserved for the section.⁶

The faculty⁷ volunteers were not necessarily the most sophisticated “hi-tech” users among the teaching staff. However, they were motivated to learn more about the impact that technology might have on law student learning, and they generously set aside time from their crowded schedules to participate in the experiment. None received release time during the two-semester experiment, and they continued with their regularly assigned teaching, administrative, and scholarly obligations. As one might anticipate, there was an inverse relationship between the time a team member devoted to experimenting with “hi-tech” tools and the pressure to meet traditional publication deadlines — as the pressure for a written product increased, the available time to experiment with “hi-tech” teaching/learning tools decreased.

The team consciously avoided overwhelming students with extraordinary “hi-tech” demands and conferred among themselves on numerous occasions to discuss each instructor’s “hi-tech” goals.⁸ During the experiment, two team members utilized a variety of “hi-tech” teaching tools and techniques on a regular basis, the third used them modestly, and the fourth occasionally.

All of the students in the “hi-tech” section were volunteers⁹ who, during the first-year registration process, opted to participate in it. Although the college administration was initially apprehensive about attracting sixty volunteers to the section, it filled by the opening day of fall classes. For a variety of reasons, one of which may have been the consistent utilization of computers in the classroom, five of the initial sixty students enrolled in the “hi-tech” section eventually withdrew from one or more of the four course offerings.¹⁰ There

was some surprise when more women than men enrolled in the section¹¹ and when it was discovered that the students possessed widely varying degrees of computer experience — from novice to expert — with less than a half dozen expert computer users in the group.¹²

The College's Information Systems department (IS) created a pre-orientation student schedule when the incoming student laptops were tested and equipped with wireless cards. Each student's laptop computer and the section's "hi-tech" classroom were ready on the first day of fall classes.¹³

Administrative functions

I was very apprehensive coming into this section. I am not "computer literate," when you said paper was obsolete I almost had a breakdown. I think the computer is extremely useful. I like being able to look at things while you are lecturing. Being able to edit the rules is a wonderful tool.¹⁴

Administrative functions for the team were handled by an electronic course management interface called Blackboard,¹⁵ and traditional casebooks and supplements were used in all four of the courses that made up the section. With the exception of the casebooks and supplements, paper was eliminated by the author in his civil procedure course, and reliance upon paper was reduced in the other courses. Course syllabi, e-mail messages, general student notices, PowerPoint slides and similar materials were usually posted to Blackboard. The supplemental course materials, once posted, were available to the students over the Internet around the clock.

Individual class size varied in the section's four courses from fifty-five to sixty students. However, class size did not appear to create any serious administrative problems. While there were periods of unusually heavy e-mail traffic between team members and students, none of the faculty perceived that the e-mail messages "buried them."¹⁶

One administrative assistant was selected at the outset of the experiment to coordinate all of the team's "hi-tech" needs, and these tasks were added to the assistant's normal faculty support chores. The administrative assistant helped faculty by posting material to the various Blackboard course sites and provided students with technical assistance regarding the use of Blackboard.

In the past, cautious faculty members using Blackboard have provided students with paper copies of the materials already posted to the interface. During the experiment, this practice was discontinued without complaint from students. Overall, the electronic administration of classes via Blackboard presented only occasional minor problems.

Classroom "hi-tech" equipment

The section's classroom was equipped with typical "hi-tech" tools. Paneled, sliding white boards, located at the front of the classroom, contained sections that revealed video screens when opened. Video screen images were created by the use of a rear screen projection system.¹⁷ A Crestron controller provided faculty with control over all of the "hi-tech" classroom functions, including sound,¹⁸ lighting,¹⁹ the Elmo overhead projector, VCR, and access to a networked or portable computer. Each student's seat was equipped with access to a power outlet, and each student's computer was outfitted with a wireless receiver installed by the College's IS department. Two transmitters mounted in the classroom provided students with adequate wireless connection to the Internet. To reduce the need to move the students, computers, and related paraphernalia from room to room, the Registrar permanently assigned a single "hi-tech" classroom to the section where all courses assigned to various team members of the teaching team were conducted.

The “hi-tech” classroom set-up provided faculty with ready access to the Internet and “hi-tech” equipment that allowed them to show videotapes, give PowerPoint presentations, play CD-ROMs, or use the Elmo to project anything that had not been electronically scanned. The classroom ceiling contained a built-in stereophonic sound system, and stationary and portable microphones were always available.²⁰

Selecting a learning theory²¹

[T] he typical law professor “has never thought about legal education. He has thought about law.”²²

The team’s student learning strategy,²³ or working hypothesis, ran somewhat counter to the more orthodox views held by many within the legal academy. The team surmised that appropriate utilization of “hi-tech” tools may enhance student learning and satisfaction because it “allows students to choose among various sensory stimuli according to their own learning styles.”²⁴ The team was uneasy with the traditional law school view that “one-size-fits-all”²⁵ in legal education and challenged the assumption that large classes must operate with complete reliance on the Socratic Method.²⁶

This “one-size-fits-all” thinking is evident in most law school admissions programs, where it is assumed that pre-tests can eliminate anyone from the applicant pool who cannot succeed in law school.²⁷ The admissions process typically relies upon a combination of an applicant’s Law School Aptitude Test (LSAT) score and undergraduate grade point average to determine an admissions score. The applicant’s admissions score is then equated with future law school success or failure.²⁸ It is also widely assumed that once an applicant is admitted to the first year, he or she will learn best by reading casebooks and attending classes that rely upon the Socratic teaching method.²⁹

The Socratic teaching method is typically used in large law school classes of from as few as thirty-five to more than one hundred students. It is viewed as efficient, simple to administer, and lucrative. The model heavily relies upon classroom dialogue and a single student assessment, which comes at the end of the semester in the form of an essay examination.

While the weaknesses of the Socratic model are well known, most faculty have been reluctant to move away from it.³⁰ One obvious weakness is its inability to provide individualized assessment of a student's progress on a regular, ongoing basis during matriculation in a course.

Supporters of Socratic teaching often reject suggestions that classroom teaching should be varied because law students may process information differently,³¹ or possess a variety of personality characteristics³² that may affect their ability to learn the law. Only modest attention is paid to suggestions that learners may have different cognitive strengths and styles³³ or that cultural diversity, and levels of worldly knowledge may affect individual learning.

The stalwart adherence to the present teaching model is most evident during faculty discussions involving the possibility of delivering "distance" legal education. Distance learning opponents argue that virtually all law school teaching must occur in a face-to-face classroom environment because this allows an instructor to examine bewilderment, body language, and vocabulary, which, they maintain, is significant to the learning process.³⁴ Proponents of distance learning respond that the assumption that faculty and students see one-another on a regular basis where this interchange occurs is fallacious.³⁵ In most cases, especially where student enrollment exceeds thirty-five, such contact is difficult, if not

impossible, to achieve. Furthermore, experience within the academy has shown that a professor teaching large classes typically regularly interacts with only a handful of students and seldom, if ever, interacts with a majority of the class.

In this experiment, the team did not completely abandon the Socratic method of teaching. Rather, the goal was to experimentally use a variety of “hi-tech” tools and techniques to enhance learning potential while retaining a great deal of the traditional classroom approach.³⁶ The team members generally agreed that personality assessment tools such as the Myers-Briggs Type Indicator suggest that students may process information differently and theorized that the use of “hi-tech” tools and teaching techniques increased the prospects for enhanced student learning. The team also generally agreed that there was substance to claims that visually-reinforced information is easier to understand and remember, and in some settings, that it is more effective than an oral presentation.³⁷ They felt that appropriate use of visuals provides clarity and enables legal concepts to be grasped more quickly by some students.³⁸ The team also recognized that learning is enhanced by student involvement, stimulation, motivation, and a general willingness to internalize material.

A professor’s commitment to the enterprise

The most important factor leading to the ultimate success or failure of the use of “hi-tech” techniques in a classroom is the instructor’s commitment to them.³⁹ Without a consistent, patient determination to experiment, while keeping in mind that failure is often as useful as success in developing new avenues of learning, it is doubtful that more than a handful of faculty will make extensive use of “hi-tech” tools on a regular basis.⁴⁰

While skepticism toward the use of “hi-tech” tools in education is on the decline,⁴¹ there is little to suggest that change will occur at anything more than a glacial pace.⁴² This may be

explained in part by the additional burdens that “hi-tech” tools place on instructors to learn new teaching skills and the associated need to develop separate skill sets to operate the hardware and software driving the tools.⁴³ The foot-dragging may also be explained by a general lack of significant support among faculty and law school administrators for the development of “hi-tech” teaching methods and materials. For example, tenure-seeking faculty will likely receive little credit for time spent developing “hi-tech” teaching methods.⁴⁴ Furthermore, faculty egos and personalities are historically so closely linked to the “sage on the stage” notion that the fear of losing this unique position, or at a minimum, allowing technology to interfere with it, may be sufficient to trigger the same vigorous opposition to technology in the classroom that distance learning has incurred.⁴⁵

Classroom distractions caused by access to computers

One distraction (although I do sit in the back row) is viewing one particular student playing games almost exclusively during class, regardless of the professor. I have been able to position my computer in such a way that I can avoid seeing most of the green screen of Solitaire; however, the clicking of the mouse buttons is somewhat distracting at times.⁴⁶

At the outset of the experimental project, the team members were uneasy about possible distractions because students in the “hi-tech section had continuous access to computers and the Internet. Would there be a tendency for bored students to play computer games, catch up on e-mail, or surf the Internet? If so, how distracting would this be to the professor and the students? The team believed that uncontrolled classroom computer access could significantly interfere with classroom pedagogy, and concern was heightened when an article appeared in the *New York Times*,⁴⁷ where a professor expressed exasperation over the distracting nature of computers in his classroom.⁴⁸

The *Times* article triggered a national e-mail discussion among law school faculty, that highlighted the wide disparity of views regarding computers in the classroom. Those opposing computers in the classroom generally sided with anecdotal evidence similar to that provided by one listserv contributor, who claimed that in one of his classes there were “23 laptops in operation and 20 or 21 of them had the game of solitaire up and running during the class.”⁴⁹

Those favoring computers in the classroom generally sided with anecdotal evidence that before computers were available, students were doing crossword puzzles, playing bingo based on what the professor said, exchanging notes, reading newspapers, playing poker, and conducting themselves in a variety of ways suggesting they were bored and not interested in participating in the learning exercise the instructor was attempting to conduct.⁵⁰ “Hi-tech” computer pioneer Professor Peter Martin provided additional support for computer use, finding that in his experience with computer-equipped classrooms, he observed “nothing that would lead me to believe that computer games and web surfing (or e-mail and online research) are a more serious threat to classroom concentration and engagement than crossword puzzles, newspapers, and private correspondence or doodles.”⁵¹

After weighing the competing views, the faculty team discussed the distraction issue with the students in the “hi-tech” section. Ground rules were established and explained. For example, one professor established two basic rules: first, if a student downloaded pornography during class, the student would be recommended for expulsion from law school; second, should the professor receive a complaint that a student was using the computer for unrelated classroom activity, and the use distracted others, the student would be recommended for removal from the class.

A hand-held portable electronic switch that could turn off the classroom wireless transmitters was obtained and made available to team members. With this device, one could instantly disable the wireless transformers in the classroom and block student access to the Internet.⁵² With the exception of when administering final exams, no one on the team ever used this device.

As the experiment progressed, the team perceived that a handful of students were sometimes using their computers during class for entertainment, e-mail, and chat room discussions. An occasional stern reminder from a member of the team about the rules tended to reduce, if not eliminate, the behavior.⁵³ When one instructor discovered that “ten or twelve students” were conducting synchronous conversations unrelated to the class discussion in Blackboard,⁵⁴ the feature was disabled for that course.⁵⁵

No students were dismissed from a course because of complaints that computer use distracted other members of the class. However, it is clear that continuous accessibility to a laptop computer provided an ongoing, almost irresistible temptation for some students to play games, send e-mail, or indulge in other activities unrelated to classroom discussion. Significant distraction is clearly possible because most students’ computer screens are viewable by others in the classroom. The key ingredients to reducing this behavior include: (1) providing clear ground rules at the outset of the course regarding computer use; (2) making a determined effort throughout the course to meaningfully integrate computer use into classroom pedagogy; (3) dealing immediately and openly with the class when a distraction issue arises; and (4) meeting the constant educational challenge of generating overall interest, intensity and involvement by the students in the topic under discussion.

Keyboard noise

Previous experiments with laptops in the classroom have suggested that only on rare occasions have complaints surfaced regarding noise generated because of student computer keyboard use.⁵⁶ Professor Peter Martin has reported that in his experience “[a]ll I spoke with, students and faculty, found that the sound of so many keyboards in action swiftly slipped into the background. Almost no one found it a significant distraction.”⁵⁷ The team’s experience was consistent with Professor Martin’s observations: there were no complaints regarding keyboard noise. However, in one course, six students preferred to write their final essay examination using the traditional blue book pen and pencil method,⁵⁸ and two of them asked for a room without computers.

Note-Taking

*It makes my notes more organized than a paper version. I was resistant to using the computer so much, but now I love it. I should star in a commercial.*⁵⁹

Supporters of computers in the classroom contend that they are an excellent note-taking device and provide at least three advantages over the traditional method of taking notes by hand. First, students with reasonably good typing skills can record the key principles of law under discussion more quickly and with greater clarity because of the increased speed offered by the computer keyboard.⁶⁰ Second, computer-generated notes are usually more legible than one’s handwriting. Third, once the notes are recorded, students may easily edit and reorganize them. Students with typing skills for whom efficiency and law school time management are priorities appear to find the computerized note-taking especially appealing.

Those who are apprehensive about computers in the classroom argue that students “may attempt to transcribe the class” using the computer.⁶¹ They contend that students with

computers are less likely to participate in class discussion if they are focused on capturing an instructor's remarks verbatim.

In response to these concerns, it has been suggested that an instructor who perceives that students have become essentially classroom court reporters should immediately address the issue with them and emphasize the value of analysis of hypotheticals and participating in in-depth discussion of legal principles over merely recording a lecture verbatim.⁶² During the experiment, the team did not perceive that students had become classroom court reporters. While note-taking may have modestly interfered with the ability of some students to participate in classroom discussion, the team did not perceive that this was a significant problem.

Providing students pre-lecture outlines

*[C]lass notes/outlines that are posted on [B]lackboard are very helpful both for pre-class preparation and post-class review. Also, I have been using the property outlines in class and modifying them as we go along.*⁶³

While a variety of teaching techniques were used during the two-semester experiment, one of the more demanding involved providing students prior to class a reasonably-detailed class outline of the areas to be covered. When used, the pre-lecture outline was sent to students as an attachment to an e-mail message. The outline provided students with goals for the coming class and details of the areas to be covered. It was routinely adjusted to reflect the progress the class was making in mastering the course. Proponents of pre-lecture outlines believe they provide students with a focused template for class discussion and tend to signal areas of study that the professor considers most significant. They act, it is argued, as a detailed guide, while still leaving much opportunity for student input.

Those opposing pre-lecture outlines make several points: first, pre-lecture outlines remove the mystery from the class lecture and discussion — leaving little drama to the session; second, they “spoon feed” law students who should be “doing their own thinking” and their own outlining. Especially in law school, goes the argument, students will not learn to “think like lawyers” if a professor continually provides a detailed outline in advance of a lecture. Furthermore, argue opponents, “real learning” occurs when students grasp the important points of a professor’s lecture and the thought process travels from the brain, to the hand, and onto paper via a pen or pencil. Finally, preparing a pre-lecture outline for every class period places an unwarranted time burden on a professor, whose scholarly duties are already time-consuming. Moreover, to expect an instructor to create a pre-lecture outline in detail for each class is unrealistic.

The team members were unable to arrive at a consensus regarding the use of pre-lecture outlines, and only two members of the team experimented with them. Based upon the student response, they found the pre-lecture outlines very helpful.

Post-lecture outlines

One member of the team, Professor Eileen Roberts, created a detailed post-lecture outline for the students in her property course. Each outline also contained links to numerous websites of interest to the topic that had been discussed in the previous class. She provided the notes with the links inserted at relevant places within them after each class. Based upon responses from students, her efforts were warmly received.

Projecting statutes, rules, regulations and cases

[T]he use of computers and [the] [I]nternet in our classroom help us to save time, and learn how to investigate cases and statutes easily.⁶⁴

As previous scholars have noted, a projection screen in a “hi-tech” classroom provides faculty with teaching opportunities unavailable until the last few years. Only three of the many possible uses of projection in the classroom are discussed here.

One common use of a projection screen is to focus classroom discussion on the precise language of a rule or statute.⁶⁵ To do this, the instructor combines the projection screen and the zoom features found in programs such as Microsoft Word to enlarge a word, phrase, or sentence that is being analyzed.⁶⁶ This technique may also be used to focus on a key passage in a decision or a paragraph of any writing. It is simple but effective.

Another use of a projection screen technique involves asking students to draft the holding of a case and obtaining it from them before or during class via e-mail or other electronic means. Once selected and placed on the projection screen, the entire class can critically discuss a student’s analysis.⁶⁷

A third use of a projection screen involves the instructor preparing a PowerPoint presentation containing relevant language from rules, decisions, or statutes. Rather than distribute a paper copy of the presentation during class on which students can make notations, most commercial interfaces⁶⁸ contain e-mail modules that permit one to send the entire presentation as an attachment via e-mail to all the students in the class with one or two clicks on the computer mouse. Once received, students can make notations during class in the notes section of PowerPoint.⁶⁹

Critics of the use of PowerPoint presentation software suggest “it [is] somewhat awkward to accommodate students’ active participation if students wish to discuss topics out of the order the professor had planned.”⁷⁰

The team experimented with the above techniques throughout the duration of the project. They agreed with the observation of Professor Peter Martin who concluded that students in “hi-tech” classes found the use of this technique particularly effective.⁷¹

The challenge of finding pedagogically useful Internet sites

I think it is very helpful to have access to [use] [I]nternet resources in class. If there is a rule that we need to get, or a case being discussed, it is very helpful to be able to access it.⁷²

The Internet, with its vast collection of digital material, presents both a challenge and an opportunity for an instructor in a “hi-tech” setting.⁷³ Meaningfully and creatively harnessing this vast database so the web-based material enhances classroom discussion and understanding of a legal topic is a significant challenge. Once having found the appropriate Internet material, the opportunity for a richer and more interesting learning environment is apparent.

While the team used the Internet in a variety of ways, the most common applications involved creating links on Blackboard to recent state and federal court decisions, new federal and state legislation, and rules and codes. For example, the Federal Rules of Civil Procedure, found at the Cornell Law School Legal Information Institute site,⁷⁴ were used extensively during the civil procedure course. One team member, Professor Eileen Roberts, successfully used the Internet to uncover dozens of historical documents, art objects and agreements that were relevant to her property course and linked those sites to Blackboard.

There are, of course, many web sites that may enhance learning in a law school course. For example, in a litigation class, students can be shown how the Internet aids in the early investigation of a case by discovering past testimony given by an opponent’s expert.⁷⁵ The

Internet can also be used to locate physicians and hospitals, find the legal standard of care in a particular state, and possibly discover licenses held by and disciplinary actions taken against specific physicians.⁷⁶

When environmental issues are raised, Internet access can provide a spectrum of information about asbestos, lead-based paint, radon, environmental tobacco smoke, indoor air quality and electromagnetic fields with links to federal agencies, such as the Environmental Protection Agency, offering a wealth of information.⁷⁷ The Internet can also be used to obtain sample agreements that corporate lawyers have used for clients⁷⁸ and extensive material about treaties.⁷⁹

By the end of the two-semester experiment, the teaching team had only begun to scratch the surface of the potential that Internet web sites offer. With each passing week, new and more useful Internet sites were discovered.

In-Class and out-of-class quizzes⁸⁰

I think the computer works wonderfully for taking quizzes. I love being instantaneously able to see the grade I received and the correct answers. I liked taking our at home quiz via the [I]nternet — it gives you much more freedom.⁸¹

I really like that we can be regularly measured by computer-administered quizzes (never thought I'd say that!). The instant response time is wonderful. I can identify immediately which subjects I should spend more time studying.⁸²

Probably the most powerful technological tool with the potential to enhance a student's education is the student assessment module found in Blackboard, TWEN and WebCt. The module provides a variety of methods for assessing student understanding of a particular legal subject. It also permits feedback that can be used by a professor to clarify points made

during class should students remain confused. Furthermore, the assessment module provides students with an opportunity to gauge their mastery of a subject.⁸³

Two members of the team conducted extensive experiments with the Blackboard assessment module, and their efforts were uniformly greeted with student enthusiasm. One member administered a major in-class examination⁸⁴ using Blackboard while the other used the assessment module in a variety of ways. There were occasional in-class drill and practice quizzes,⁸⁵ and out-of-class quizzes that students could take within a reasonable time.

A major advantage of an interface such as Blackboard is its ability to score automatically certain types of exercises, provide immediate feedback, and post the results to a student's online gradebook.⁸⁶ All of the interface assessment modules provide a variety of faculty options in terms of viewing quiz results including a gradebook, which contains a summary list of the student names and their scores.

While all of the quiz formats appear helpful, the short essay format is particularly useful in the law school setting. This format can be used in a number of ways: for example, a professor may develop a long problem, break it into a series of short quizzes, and over a period of weeks take student on a step-by-step voyage from the problem's beginning to its end. Or, a professor may use it to give bi-monthly essay quizzes on topics that have been covered. With practice, the team found that one can quickly read and grade short student essays directly from his computer screen.

Once an instructor is committed to using an assessment module, the challenge is to prepare quality questions and answers.⁸⁷ From our experience, this is more difficult than it might appear at first glance, and it can be very time-consuming. However, once having completed a set of questions and answers, the second revision goes much faster.

The team was occasionally asked how the approach it took to developing quizzes differed from CALI exercises.⁸⁸ There were two responses: first, the quizzes created for each class are *customized* to reflect the strengths, weaknesses, and actual progress the students are making in mastering a course; second, the use of *short essay questions* differs from CALI exercises, which rely primarily on other assessment tools.⁸⁹

E-mail

E-mail communication played little role in legal education until the early 1990's when personal computers became more available and were networked together within the academic community. Today, e-mail is widely used and is viewed as a secure and effective means of communication. Most e-mail uses are well known. For example, e-mail permits information to be distributed rapidly and without incurring the costs associated with photocopying and distributing information via student or faculty mailboxes. It can also be used to schedule committee meetings, distribute minutes, contact alumni, and initiate scholarly discussion of substantive topics.

Other uses include communicating with students on a variety of administrative matters, such as sudden emergencies forcing class cancellation, changed reading assignments or other unanticipated classroom changes. It enhances communication with instructors because students can send an instructor an e-mail question about a particular issue or problem at any time and from any place they have access to a computer and the Internet. With little effort, the instructor can respond by sending an answer to the student question to everyone in the class.⁹⁰ Such a response usually prevents others from sending identical e-mail questions or unnecessarily visiting the instructor's office.

The faculty team found e-mail particularly useful during the annual visit of the Eighth Circuit Court of Appeals to the college. For several years, a panel of the Circuit had visited the college and heard oral arguments with three hundred or more students in attendance. In past years, paper summaries of the issues raised in the lawyers' briefs were distributed to a select number of the student body shortly before the oral arguments. In 2001, the Eighth Circuit Court of Appeals Clerk's office required that all lawyers file a digital and a printed copy of their brief.⁹¹ Because of this change, it was possible for the college to obtain a digital copy of each brief filed with the Clerk's office prior to the oral arguments. The digitized briefs were instantly distributed throughout the college as attachments to an e-mail reminder of the court visit. Consequently, students and faculty were now able to spend class time prior to the arguments more effectively by discussing oral advocacy strategies, substantive law, and persuasive writing techniques.

E-mail is also a useful tool to support collaborative activities such as student groups assigned to draft agreements, appellate briefs, complaints, answers, motions, or other legal documents. Student groups can use e-mail to transmit their drafts among themselves and receive return e-mail comments from other members of the group. During this experiment, the author assigned drafting problems to student groups and encouraged them to use e-mail to continually discuss their drafts. The effort was perceived as a success.

There are, of course, other collaborative activities where e-mail is an important educational tool.⁹² For example, an instructor can design a discussion problem and send it to a limited number of students with directions to analyze and e-mail the analysis back to the instructor within a designated period of time. When the student analysis is received, the instructor can then send that analysis to a new group of students and ask them to comment on

the original student effort within a designated period of time. Once all of the comments have been gathered and compiled by the instructor, they can be distributed for in-class discussion.⁹³

Another use of e-mail involves an instructor in a seminar setting sending a problem via e-mail to students with instructions that they assume the legal personality of a particular member of the Supreme Court. When adopting that legal personality, students are asked to resolve the problem by drafting a short opinion that they believe the justice, whose identity they have assumed, would write. Before class, students circulate drafts of their opinions for comment among other members of the pretend-bench using e-mail. Ultimately, each student sends the instructor and classmates the finished opinion that the student believes the “pretend” judge would issue.

E-mail can also be used to obtain outlines and rough drafts of student research papers. However, because there is often no e-mail anonymity, final exams are usually not accepted by the instructor via e-mail.⁹⁴ Anonymity can be protected if the final exams are sent to the Registrar, Student Services unit, or faculty administrative assistant who strips the student’s name and prints them out to be graded.⁹⁵

Surveys

Blackboard and similar interfaces permit surveys on a variety of matters. For example, one may desire to assess student attitudes toward computer use, course content, or course pace. Surveys may, of course, be administered anonymously.

Threaded Discussions

Threaded discussions provided one of the earliest opportunities for faculty to experiment with enhancing student learning via the computer. While the idea of threaded discussions probably originated with e-mail and the creation of listservs, threaded discussions are commonly held today in modules that programmers have specifically designed and placed into an interface for this activity.⁹⁶

Threaded discussion modules have many uses. In its simplest form, an instructor can post a question to the threaded discussion site. When students arrive at the site, they read the question, and respond by clicking on a link and typing their analysis. The threads develop as more and more student comments and questions are added to the discussion, sometimes interspersed with faculty direction and reflection.

Threaded discussions may be used outside a classroom to continue discussion of questions raised during a class period or to prepare students in advance of class for an in-depth discussion of a particular topic. An instructor can, for example, ask students to submit questions for possible posting in advance of class and select the more useful of them for a threaded discussion.

Threaded discussion modules can be effective learning tools in seminar settings where a student, who is preparing to present a paper, is asked to submit an early draft so it can be placed into the threaded discussion module before the presentation. Once posted, a question or two about the seminar paper can be put up by the instructor and a response from a limited number of students requested. When these replies are received, a new group of students can be assigned to analyze them. This approach should significantly raise the level of discussion

and understanding of a legal problem among the group when the student paper is finally presented.

Another use of threaded discussions involves the professor placing new cases into a threaded discussion module and assigning students the task of analyzing them and posting their holdings to the module. This technique may help keep the class up-to-date on the latest developments in a field and encourage deeper, more reflective classroom thought.

The faculty team discussed the use of threaded discussions throughout the two semesters of the experiment; however, they conducted only minimal experiments with them. Because of their involvement with other techniques, the team had little time to fully explore the many uses of a threaded discussion module.

Communication with the instructor

It has been suggested that computerization in the law school environment may discourage office visits and reduce the human contact between students and professor. It has also been suggested that computer use may increase the likelihood that the student, as an attorney will be alienated “from the human client, from the community, and even from himself.”⁹⁷ The team did not find evidence to support these views. Usual office visits continued, and in some cases, appear to have increased. In addition, there was a fairly constant stream of questions, problems and contacts via e-mail. The e-mail, which was sometimes viewed by some members of the team as a nuisance on a “really busy day,” allowed team members to gain a significant amount of insight into the section and individual student ability that could not have been obtained without this tool.

Synchronous Chat rooms

One of the most powerful “hi-tech” learning tools is the synchronous chat room. This tool, which makes group discussion possible under almost any condition, has a number of uses. For example, student study groups can meet from their homes or dormitory rooms on a blustery winter’s evening to review for exams. Faculty and administrators can use them for brainstorming, collaboration projects and general consultation. They are available around the clock for individual and group tutorials and office hours. In addition, experts from around the world can be brought into a classroom via a synchronous chat.⁹⁸ Finally, they can be used for social purposes, such as the student and teacher greeting each other at the beginning of a class and sharing personal information such as engagements, births, awards and deaths.

Given these advantages, why are faculty apparently so reluctant to use chat rooms? One reason may be a general unfamiliarity with this mode of communication. Faculty may also lack interest in the tool as a teaching-learning device, fail to have access to a chat room training program, or believe that there is insufficient time to plan synchronous discussion sessions. Faculty may be self-conscious and fearful of making a typing mistake such as forgetting to put a question mark after posing a question, or of using the word “course” for “coarse.” They may also lack typing skills, possess a general fear of failing, or believe that chat room discussions add little of significance to the learning process.

The all-Internet law school, Concord, has developed an excellent chat room model.⁹⁹ Concord’s synchronous chat rooms convene on a weekly basis where discussions are lead by a professor. After a session concludes, students may continue their discussions asynchronously using Concord's Discussion Boards.¹⁰⁰ Although Concord claims its faculty

can manage about forty students in a chat room, most instructors with some experience using traditional chat room tools believe a much smaller chat room population is preferable.

Concord sets up its chat rooms in a three-stage process: First, it requires that students install a sound/video card on their computers so they can receive streaming video and audio. Second, they are asked to download a free version of a software program called *RealAudio* and install it on their computer.¹⁰¹ *RealAudio* allows students to hear their instructor's voice during the chat room sessions. Third, Concord provides its instructors with a software program to install on their computers that permits them to speak to students over the Internet in real time while maintaining control over student input. This software eliminates a major mechanical obstacle to chat room use, which is reliance on faculty to possess reasonably good typing skills.

Concord students and faculty can meet anywhere they can gain access to a computer with a sound card that is linked to the Internet. During a session, faculty pose questions by speaking into a tiny microphone attached to the computer and students respond using their computer keyboards. A management monitor on the faculty member's computer screen flashes each student's response to the professor, who is the only person seeing it. If the response is one that the professor believes will enhance the discussion, it is posted. If the response indicates that the student needs additional assistance, the professor can communicate individually by sending a note, unseen by others, to the sender. The software allows the professor to direct chat room discussion and eliminate confusing or distracting comments. It also keeps the professor in complete control of the pace of the discussion, which helps maintain student interest.¹⁰²

Students generally like chat rooms. They see them as democratic and gender neutral,

and as a welcome change from the traditional classroom. Typically, traditional classroom settings are formal, with a professor at the front of the room in total control of when and upon whom someone will be called. Students sit in assigned seats. Chat rooms, in contrast, are perceived by students as being quite different from the traditional classroom setting. In a chat room, they are working as a team with the professor to resolve a problem. Students also like the freedom to circulate freely and speak more openly and spontaneously than they can in a traditional classroom. Finally, most chat room software allows students to talk to a professor without raising a hand or having other students necessarily "hear" the question, or even knowing it is this particular student who is asking it.

The synchronous chat room, if effectively harnessed, is a powerful pedagogic tool. It is probably the most underutilized of all electronic educational tools available to law faculty.

Socialization

I am thankful to be part of the "cyberspace classroom." It has been helpful to learn how to look up statutes, case law, and Federal law (etc.) during class. Also, I think that our classroom is more unified and supportive of each other with the heightened level of communication -- more e-mail, chatrooms, etc. Blackboard is working well as a cyberspace classroom.¹⁰³

An unexpected pleasant surprise for the team was to observe the close knit socialization that occurred among the students in the experimental section. Team members and others who have observed dozens of first-year law student sections concluded that in their experience they have never observed a group "as close" as the experimental "hi-tech" section.¹⁰⁴

One explanation may be, as some suggest, that the social impact of e-mail "serves as the new office water cooler, allowing people to socialize informally and efficiently."¹⁰⁵ E-mail

is also claimed to be by nature, "an egalitarian form of communication," that reduces the hierarchical distinction between professor and student and encourages cooperation and the sharing of ideas.¹⁰⁶

Another reason for the socialization may have been the regular use of the assessment tools and fairly constant communication between instructor and student. These factors may have removed some of the impersonal atmosphere and the passivity that some claim a traditional classroom encourages.¹⁰⁷ Regardless of the reasons, the team was unanimous in concluding that socialization among the students was the strongest they had ever witnessed in their more than seventy-five years of collective teaching experience.

Efficiency

There is some evidence from this experiment that students using computers on a regular basis in law school may become more efficient in handling the chores associated with some law school courses, simply because of their in-class experience with the machines. Support for this proposition is found in a Spring 2002 survey conducted by the faculty teaching William Mitchell's Writing and Representation course ("WRAP").¹⁰⁸ WRAP emphasizes the development of legal writing and research skills.

The survey asked all students in the five first-year sections to estimate on average how many hours per week they spent preparing for WRAP, including class time. The students in the "hi-tech" section reported that they spent six hours or less per week than did those in sections one and four. This is a remarkable figure in view of the fact that all sections had identical work assignments for the WRAP course throughout the semester.

HOURS STUDENTS SPEND ON WRAP WORK PER WEEK, ON AVERAGE, INCLUDING CLASS TIME¹⁰⁹

	Mean	Standard Deviation
Section 1	14.58	8.5
Section 2	10.97	6.2
Section 3 (“Hi-tech”)	8.11	3.17
Section 4	14.49	6.98
Section 5	12.66	5.89

The significant difference reported by the survey between the “hi-tech” section and the other four sections may be explained in part by the fact that as the spring semester approached, students in the “hi-tech” section had already spent countless hours both in class and out-of-class with their personal computers, writing essays, taking exams, and conducting research. Few, if any, students had similar experiences in the other four sections. The intimacy of students in the “hi-tech” section with how to conduct research from a computer keyboard, edit and produce essays made their work with WRAP much easier. Of some note is the fact that WRAP faculty, who on occasion receive complaints from students regarding the heavy course workload, were perceived as having few, if any, complaints.

Conclusions

*I hope that we go further in attempts to use the computer to communicate and share information in the class. It makes the classroom more dynamic and more conducive to learning. Do not give up on the technology, continue to pursue it.*¹¹⁰

The experiment was a learning experience for everyone: students, faculty and the college administration. Many students expressed the belief that the use of technology was helpful in mastering legal concepts. Presumably, the law school administration was convinced by the apparent success of the endeavor, having cautiously expanded its “hi-tech” offering to two

sections for the fall 2002 entering class.¹¹¹ It also announced that two upper division classes, real estate and family law, would also go “hi-tech.”

A note of caution, however, about the experiment. One should approach the issue of requiring computers in the classroom with care. Our experience suggests that merely requiring computers in the classroom – without linking the requirement pedagogically to the classroom experience -- may be somewhat counterproductive. For students who see the computer as providing a major note taking advantage, the requirement is meaningless because those students will still bring their computers to class. For those who prefer to take notes by hand, the requirement may make little sense. In other words, if computers are required, one has to provide rational, pedagogical reasons for the mandate.

The team experience reaffirmed many of the reasons given by others to explain why “hi-tech” tools are not widely used within the academy. One finds well-intentioned but relatively modest administrative support for their classroom use. “Hi-tech” classrooms are expensive to build and maintain. In addition, there is fierce competition for faculty time to produce traditional publications and to experiment and develop “hi-tech” teaching and learning techniques. There may also be only modest colleague encouragement and recognition for “hi-tech” experimentation. Furthermore, the potential for off-campus, lucrative faculty consulting is an ever present threat to these time consuming projects.

Another obstacle is the limited faculty training in the use of “hi-tech” software and hardware, which generally carries a relatively low university or college funding priority. For example, faculty involved in this endeavor mastered the use of the “hi-tech” hardware and software with little inside or outside training; however, a formal pre-training effort would have reduced the time spent learning simple procedures-time that could have been better

spent developing “hi-tech” techniques, problems, and illustrations.¹¹² Unfortunately, and in light of the *U.S. News and World Report* law school rankings race, it is questionable whether a major change in teaching methods will occur in the 186 or so accredited American Bar Association law schools.

There are also more subtle obstacles that may discourage classroom computer use. For example, our law school provides students with lockers; however, they are not large enough to permit computer storage. This tends to discourage some students from using computers because they do not want to carry them back and forth from their living facilities to the law school. Another example is the absence of student classroom access to power to run their computers. Without power in all classrooms and seminar rooms, the nuisance of dead batteries on student computers will quickly put a damper on a computer project.

On a positive note, we found that a short pre-first-day orientation and computer registration program, where the IS staff installs wireless cards and checks over each student’s computer was extremely helpful to the success of the project. However, students could have used an in-house computer loan/repair program that allowed them to temporarily check out a computer while their machine was being repaired.¹¹³

Faculty who develop a “hi-tech” learning environment should be equipped with the fastest computers the institution’s budget can tolerate. The reason for this is that computer speed makes handling the increased volume of e-mail, postings, and Internet research much faster and less frustrating. Frustration is another barrier to wide-spread educational use of computers.

The role of a college or university IS unit is critical to the success of a “hi-tech” project. An IS unit that enthusiastically supports a project and is committed to 24/7 support can make

a significant difference in the outcome of a “hi-tech” experiment. To encourage cooperation and develop a positive spirit between faculty, students and the IS personnel, the team invited the IS unit to student parties and special events and provided several opportunities where the IS staff could discuss computer problems with the students. One result was the observable pride the IS unit took in the project and the special attention to student concerns that flowed from their pride. The *esprit de corps* permeated their work and helped give struggling students confidence in operating their computers and access Blackboard.

The College Registrar can play a helpful role in encouraging the use of computers in the classroom by reducing the need to move first-year students and computers from room to room between classes. Computer usage is discouraged when students are forced to move between classes with an armload of books, coats, and computer bags.

There appears little reason why law school courses are not administered by faculty using an interface such as Blackboard, TWEN or WebCT. The administrative functions these interfaces offer are simple to learn, require minimal maintenance, and are reasonably reliable.¹¹⁴ For faculty who abhor the thought of any use of technology, support staff can be trained to post syllabi, send e-mail, and create links to statutes, cases and other material.

The experiment was a pleasant teaching experience for the team, who reveled in the growth of student confidence in their ability to master the operation of a computer and to conduct research, take notes, and stay engaged in classroom discussion. At the end of the experiment, the team felt that students with few or modest skills had become very proficient at using a computer and accessing and using the Internet – skills that will aid them as they enter their legal careers. Furthermore, the indication garnered from the WRAP survey that students in some courses are saving a large amount of time with computers is significant.

These are clearly early days in the use of technology to enhance learning in a law school classroom. However, the team is satisfied that technology can be integrated into a traditional law school classroom and that its use carries the potential of significantly enhancing student learning. Much more needs to be done, and progress in this area will require solid administrative support and faculty courage. It is hoped that both commodities will increase in availability and usage as the digital age continues to unfold.

¹ Survey of the William Mitchell College of Law experimental “hi-tech” section students (anonymous quotation) (2001) (on file with the University of Richmond Journal of Law and Technology).

² In one sense, this may not be that unusual. After all, most law faculties are the product of an educational system that was driven by traditional teaching approaches. Their educational experiences were textbook-driven, and their primary goal was to master information found in books. This may explain, at least in part, their reluctance to experiment with “hi-tech” teaching tools to enhance classroom learning.

³ Law professors increasingly are using [technology and] the Internet to supplement their course materials and enhance their teaching skills. They are using it to create interactive, educational computer software, to provide a forum for peer review of student work products, to encourage collaborative learning, to provide a structured out-of-classroom learning environment, to foster a tighter community of educators, to extend office hours, to supplement and update class materials, and to promote faculty collegiality. But does Web based instruction work in the classroom?

Jayne Elizabeth Zanglein & Katherine Austin Stalcup, *Te(a)chnology: Web Based Instruction in Legal Skills Courses*, 49 J. LEGAL EDUC. 480, 480 (1999) (footnotes omitted).

⁴ William Mitchell College of Law, 875 Summit Avenue, St. Paul, Minnesota. The college is a free-standing institution with an enrollment of approximately 1,000 full and part-time law students. It is ABA accredited and a member of the American Association of Law Schools.

⁵ There were also some electronic experiments conducted in the section’s Writing & Representation: Advise & Persuasion (WRAP) course. One of them involved transmission of writing projects, which were graded anonymously.

⁶ In American Legal Education, the primary pedagogical mode still is a Socratic, case-based, classroom discussion of cases assigned from a (usually non-electronic) casebook. In practice, American law professors often interleave Socratic discussion with a lecture mode of teaching. In addition, at least four other general teaching modes have become increasingly

popular: (1) legal practicum courses, (2) legal clinical courses, (3) role playing exercises, and (4) problem-based teaching.

Kevin D. Ashley, *What I Told the Law and Computers Association of Japan About Information Technology in Law School Education*, 62 U. PITT. L. REV. 545, 547 (Summer 2001) (footnotes omitted); *see also* Stephen M. Johnson, *www.lawschool.edu: Legal Education in the Digital Age*, 2000 WIS. L. REV. 85, 88 (2000).

⁷ The faculty team consisted of Professors Christina Kunz (contracts), Robert Oliphant (civil procedure), Eileen Roberts (property) and Michael Steenson (torts).

⁸ The team sought to avoid technology from becoming the focal point in the classrooms and thereby overshadowing the development of fundamental skills such as legal analysis and reasoning.

⁹ The college offers five first-year sections with approximately sixty students in each section.

¹⁰ The courses offered were civil procedure, contracts, property and torts.

¹¹ Twenty-nine female and twenty-six male students completed the two-semester course in at least one of the four courses offered. The ratio in at least one course was thirty females to twenty-six male students (the disparity results because all students were not required to enroll in all four courses).

¹² There was some initial thought that only computer proficient “geeks” would be attracted to the section. The team was delighted with the section’s diversity in terms of the wide-range of computer ability demonstrated by the students.

¹³ Laptops were not required for the first-year students in the other four sections.

¹⁴ Survey of the William Mitchell College of Law experimental “hi-tech” section students, *supra* note 1.

¹⁵ For a variety of reasons, the college purchased the Blackboard interface and located it on its own server.

¹⁶ It is extremely important to equip faculty in a program such as this with very fast computers. The difference between using an IBM 486 and a Dell 8200 is night and day. Without a computer properly equipped with a significant amount of RAM, handling the chores related to effectively operating a modern interface can become frustrating.

¹⁷ The author does not recommend the use of rear projection system in a hi-tech classroom because of the cost, quality of projected image, and the recent development of powerful, reasonably priced, quiet projectors that can be easily attached to the ceiling of a classroom.

¹⁸ The classroom was equipped with a stereophonic sound system with small speakers placed throughout the facility. This eliminated any dead spots, which interfere with sound

transmission, and insured that whatever a professor said was easily heard by a student. To be effective, of course, the teacher had to use a portable or standalone microphone.

¹⁹ Lighting is probably one of the more overlooked considerations in hi-tech rooms. Students should sit in a brightly lighted classroom and the area where the video screens are located should be darkened. Occasionally, a faculty member may want a portion or virtually all of the room quite dim in order to show a video tape, or for some other reason. When putting a lighting system into a “hi-tech” classroom, there should be a minimum of five separate lighting settings available to the faculty from the Crestron controller.

²⁰ The team would have preferred installation of additional software that allows easy two-way communication between the instructor and students in the classroom.

²¹ When enhancing a classroom through the use of Blackboard, TWEN, WEB CT or similar program, a professor should ask: “Do I have a theory about how students learn best in my classroom?” “What do I do best in the classroom?” “Are there tools that may significantly enhance learning inside and outside the classroom that I am not using?”

²² Ronald H. Silverman, *Weak Law Teaching, Adam Smith and a New Model of Merit Pay*, 9 CORNELL J.L. & PUB. POL’Y 267, 273-74 (2000) (quoting Robert M. Hutchins, *The Current of Legal Education*, 1929 KY. B. ASS’N J. 258, 271).

²³ See Paul T. Wangerin, *Learning Strategies for Law Students*, 52 ALB. L. REV. 471 (1988). A “learning strategy” is a technique for maximizing learning from instruction including teacher study, time management, efficient reading, note taking, review, and problem solving. *Id.* at 472-73.

²⁴ See Zanglein & Stalcup, *supra* note 3 at 481.

²⁵ Zanglein & Stalcup, *supra* note 3 at 481.

²⁶ “Law school instruction typically uses the Socratic method, or some variation of it The Socratic instructor does not present an analysis of a legal issue to students who passively record that analysis in their notes; rather, the students themselves construct the analysis in response to questions the instructor poses.” Richard Warner et al., *Teaching Law with Computers*, 24 RUTGERS COMPUTER & TECH. L.J. 107, 112 (1998), available at <http://www.kentlaw.edu/distancelearning/papers/eteach.html>; see also Steven I. Friedland, *How We Teach: A Survey of Teaching Techniques in American Law Schools*, 20 SEATTLE L. REV. 1, 31 (1996) (noting that twenty-one and forty-eight percent of law school faculty surveyed stated that they did not rely entirely on the Socratic method of teaching but used a variety of teaching techniques and methodologies, including drafting and “writing projects, student presentations, watching videos, guest lectures, simulations, and demonstrations”).

²⁷ Zanglein & Stalcup, *supra* note 3 at 481.

²⁸ Zanglein & Stalcup, *supra* note 3 at 481.

²⁹ Zanglein & Stalcup, *supra* note 3 at 481.

³⁰ “Many teachers are especially reluctant to try innovative methods in large classes.” Gerald F. Hess, *Seven Principles for Good Practice Legal Education: Principle 3: Good Practice Encourages Active Learning*, 49 J. LEGAL EDUC. 401, 405 (1999).

³¹ *See generally* Zanglein & Stalcup, *supra* note 3. A number of learning theories are discussed in this article. In part, the authors argue that a law school classroom may consist of analytic and global learners, left-brained and right-brained learners. Zanglein & Stalcup, *supra* note 3 at 484-85.

³² Zanglein & Stalcup, *supra* note 3 at 485. The Zanglein article discusses the Myers-Briggs Type Indicator test, which is an inventory that categorizes personalities according to Jung's theory of personality preferences. *See generally* Vernellia R. Randall, *The Myers-Briggs Type Indicator, First Year Law Students and Performance*, 26 CUMB. L. REV. 63 (1995) (comparing performance in law school with Myers-Briggs test output).

³³ Zanglein & Stalcup, *supra* note 3, at 488 n. 45. *See generally* HOWARD GARDNER, *MULTIPLE INTELLIGENCES: THE THEORY IN PRACTICE* (Basic Books 1993); HOWARD GARDNER, *FRAMES OF MIND: THE THEORY OF MULTIPLE INTELLIGENCES* (Basic Books 1983).

³⁴ *See* David M. Becker, *Some Concerns About the Future of Legal Education*, 51 J. LEGAL EDUC. 469, 484 (2001) (evincing concern that technology may promote distance, and not closeness between people, depersonalization, and a decline of civility).

³⁵ “[T]he only interaction many law students get in large lecture classes is to ‘lay eyes’ on the professor. Students may get the interaction when called upon, but in large classes that might only happen twice a term. Otherwise, the experience is often as distant as could be.” Josh Ard, *Serving Over the Net: Legal Education Over the Internet*, 79 MICH. B.J. 1050 (2000) (quoting Posting of William Boletta, student at Concord University Law School, to JURIST@law.pitt.edu, (online discussion began Sept. 15, 1999), available at <http://jurist.law.pitt.edu/colloq1.htm>).

³⁶ “The claim that computers can be effective tools for achieving important pedagogical goals naturally raises the question: What goals? We will focus on three widely accepted aims: (1) Imparting a basic knowledge of black letter rules. An adequate knowledge of an area of law requires knowledge of the relevant legal rules. Of course, knowing the black letter rules is a far cry from understanding the law. Part of understanding the law is knowing the underlying rationales the various purposes behind the black letter rules. Hence, the second goal: (2) Developing an understanding of the rationales underlying the rules. The purpose of a rule guides its application to fact patterns and is the key to identifying and justifying exceptions and to resolving conflicts with other rules. Of course, you can, in three years of law school, teach only a small fraction of black letter rules and associated rationales, no matter how intensively you try to educate students. This is one reason it is essential for students to learn

how to master new areas of the law on their own. This implicates the third goal: (3) Developing the ability to analyze legal issues independently.”
Richard Warner, et al., *supra* note 26 at 110-111.

³⁷ See Ellen Freedman & Donald J. Martin, *New Tricks, Learning to Use Courtroom Presentation Tools*, 23 PA. LAW. 28 (2001).

³⁸ *Id.* at 29; see also Roger Crampton, *The Current State of the Law Curriculum*, 32 J. LEGAL EDUC. 321, 322 (1982) (arguing that the “central aspect of learning is that the initiative and energy must come from the learner; our task as teachers is to organize, inspire, and facilitate the learner in acquiring new knowledge, skills, and potentialities.”)

³⁹ 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, 143 (1997) (noting that “many faculty members remain somewhat wary of these technological changes”); see generally Robert H. Thomas, “Hey, Did You Get My E-Mail?” *Reflections of a Retro Grouch in the Computer Age of Legal Education*, 44 J. LEGAL EDUC. 233, 233 (1994) (asking whether the “relatively recent introduction of computers to law schools affect[s] the perceived or real decline in the profession”).

⁴⁰ Publication is heavily weighted in tenure decisions. This emphasis on scholarship derives from law schools' aspirations for upward mobility within the law school hierarchy. Law schools enhance their prestige based, in significant part, on faculty publications; teaching skill or effectiveness is not considered in the rankings. Thus, law professors, like most academics, have an incentive to be minimally competent teachers and excellent scholars. Michael Hunter Schwartz, *Teaching Law by Design: How Learning Theory and Instructional Design Can Inform and Reform Law Teaching*, 38 SAN DIEGO L. REV. 347, 360-61 (2001).

⁴¹ Shelley Ross Saxer, *One Professor's Approach to Increasing Technology Use in Legal Education*, 6 RICH. J.L. & TECH. 21, 2 (2000) (finding that the legal profession is becoming less resistant to change in the technology area by noting examples of increased use of technology in law firms and the televised O.J. Simpson trial).

⁴² See Schwartz, *supra* note 40, at 360-62.

⁴³ See Geist, *supra* note 39, at 162.

⁴⁴ See Hess, *supra* note 30, at 405. “One reason for faculty resistance to innovation in teaching is the time and energy required to learn new techniques. It is certainly true that significant change in instructional methods requires an initial investment of time. Teachers, like their students, cannot learn new skills without commitment and effort.” *Id.* at 404.

⁴⁵ “One can anticipate that the biggest source of faculty opposition to distance learning techniques will derive from the professors' sense of independence and tradition. Most of us honor Justice Holmes' maxim that we should do legal education not only in a competent matter but also in the ‘Grand manner.’ The paradigm of a successful law school class

involves considerable theater. There is great ego satisfaction in teaching one of these classes. To the extent that distance learning technology pulls professors off center stage in the classroom and turns them [sic] into video producers and casting directors, the thrill of teaching law will diminish.”

Henry H. Perritt, Jr., *The Internet is Changing the Face of American Law Schools*, 33 IND. L. REV. 253, 273 (1999); see, e.g., Hess, *supra* note 30, at 405.

⁴⁶ Survey of the William Mitchell College of Law experimental “hi-tech” section students, *supra* note 1.

⁴⁷ Ian Ayres, *Lectures vs. Laptops*, N.Y. TIMES, March 20, 2001, at A25.

⁴⁸ During listserv discussions about classroom control, triggered by this opinion piece, some faculty suggested that laptops be banned. One professor asked, “Is there no effective control?” Anonymous posting to listserv (copy on file with author).

⁴⁹ *Id.*

⁵⁰ *Id.*

⁵¹ Warner et al., *supra* note 26, at 141; see also Geist *supra* note 39, at 143 (observing that “many faculty members remain somewhat wary of these technological changes”); William R. Slomanson, *Electronic Lawyering and the Academy*, 48 J. LEGAL EDUC. 216, 216 (1998) (suggesting that the use of technology in legal education may be the responsibility of all legal educators); see generally Ronald W. Staudt, *Computers at the Core of Legal Education: Experiments at IIT Chicago-Kent College of Law*, 35 J. LEGAL EDUC. 514 (1985) (describing the IIT Center for Law and Computers as an institution that works towards improving the productivity for lawyers and law students through technology); David J. Maume, Jr. & Ronald W. Staudt, *Computer Use and Success in the First Year of Law School*, 37 J. LEGAL EDUC. 388 (1987) (explaining the goals of the IIT Center for Law and Computers as using technology in order to “increase the learning capacity and motivation of the student”). *Contra* Thomas, *supra* note 39, at 233 (expressing concern that the “recent introduction of computers to law schools affect[s] the perceived or real decline in the profession”).

⁵² The switch was not an effective tool because students could still reach the Internet via wireless cards transmitting from outside the classroom.

⁵³ Instructors who used the portable microphone and “roamed” the classroom presented a formidable deterrent to using the computer for fun and games. Calling on students at random, and especially (but only occasionally) on those suspected of game playing, is an additional technique that reduces distracting student behavior. Preparing in advance of class to use techniques that rely on student computers is the best deterrent and probably the most challenging for most faculty.

⁵⁴ The Virtual Classroom develops an archive of the discussion and while conducting a routine check of that tool the professor discovered the conversations.

⁵⁵ Blackboard allows instructor to activate or disable various features at any time.

⁵⁶ *See* Warner et al., *supra* note 26, at 140-41.

⁵⁷ Warner et al., *supra* note 26, at 140-41.

⁵⁸ Students were given the option of taking their exams on the computer or in the traditional manner.

⁵⁹ Survey of the William Mitchell College of Law experimental “hi-tech” section students, *supra* note 1.

⁶⁰ To the extent that a student possesses typing skills, the ability to take notes is enhanced. *But see* Saxer, *supra* note 41, at 10 (reporting that some students found technology to be a hindrance to classroom discussion).

⁶¹ Warner et al., *supra* note 26, at 139-40.

⁶² Saxer, *supra* note 41, at 10.

⁶³ Survey of the William Mitchell College of Law experimental “hi-tech” section students, *supra* note 1.

⁶⁴ Survey of the William Mitchell College of Law experimental “hi-tech” section students, *supra* note 1.

⁶⁵ *See* Ashley, *supra* note 6, at 558.

⁶⁶ Note that while in Microsoft Word, type faces may be increased or decreased in size by simply holding down the control key with the left hand and using the roller ball on the mouse in the right hand as a zoom key.

⁶⁷ Depending on the circumstances, a professor may prefer to discuss the submission anonymously.

⁶⁸ Blackboard, WebCt, TWEN.

⁶⁹ This assumes that each student has the full version of PowerPoint, which permits editing and note taking. Microsoft provides a free viewer-only software program for PowerPoint, which can be downloaded from its web site.

⁷⁰ *See* Ashley, *supra* note 6, at 558.

⁷¹ *See* Warner et al., *supra* note 26, at 115.

⁷² Survey of the William Mitchell College of Law experimental “hi-tech” section students, *supra* note 1.

⁷³ The effort to discover and effectively use Internet sites in the classroom rests primarily upon the persistence and teaching talent of the instructor.

⁷⁴ See Welcome to the Legal Information Institute, at <http://www.law.cornell.edu> (last modified Jan 2, 2003).

⁷⁵ See Clifford Britt, *Focus Finding and Investigating Medical Experts on the Internet*, NCATL TRIALBRIEFS MAGAZINE, Sept. 2000, available at 2000 WL 33768186.

⁷⁶ *Id.*

⁷⁷ Environmental Protection Agency, at <http://www.epa.gov> (last modified Jan 6, 2003); see also American Bar Association, Section of Environment, Energy and Resources, at <http://www.abanet.org/environ/committees/secondgeneration/thomas.html> (last modified Sept. 4, 2002)(providing numerous links to environmental law resources).

⁷⁸ See generally Paul E. Washington & Michael Stefanoudakis, *The Internet: A Great Resource for Corporate Lawyers*, 28 COLO. LAW. 65 (Apr. 1999).

⁷⁹ See, e.g., Fletcher-Ginn-Multilateral Project, at <http://www.tufts.edu/fletcher/multilaterals.htm> (last modified Dec. 30, 2002).

⁸⁰ “[P]robably the key piece of missing content that needs ramping up for both [law school] distributive and distance learning models alike are interactive quizzes and similar self-evaluating products that provide quantitative and qualitative indications of progress through a course.” Nicolas P. Terry, *Bricks Plus Bytes: How ‘Click-and-Brick’ will Define Legal Education Space*, 46 VILL. L. REV. 95, 121 (2001).

⁸¹ Survey of the William Mitchell College of Law experimental “hi-tech” section students, *supra* note 1.

⁸² Survey of the William Mitchell College of Law experimental “hi-tech” section students, *supra* note 1.

⁸³ One possible use of the quiz module is to give an in-class pop quiz and produce the student answers on the video screen for discussion.

⁸⁴ Additional computers were placed in the classroom by the college IS department on the examination date as backups should a laptop computer malfunction.

⁸⁵ These were given during the last twenty minutes of a class. Should a student laptop malfunction, students were asked to go to the computer lab to complete the exercises.

⁸⁶ An instructor has a variety of avenues regarding the use of the module. The quizzes may be taken anonymously or by name. The gradebook can deliver grades automatically via the computer or may choose to keep them unavailable.

⁸⁷ Only after students had taken an assessment exam were the answers provided.

⁸⁸ The Center for Computer-Assisted Legal Instruction (CALI) is a consortium of law schools that researches and develops computer-mediated legal instruction and supports institutions and individuals using technology in legal education. There are over 150 lessons in 27 different areas of law. Center for Computer-Assisted Legal Information: About CALI, at <http://www.cali.org/about/> (last modified Oct. 18, 2002).

⁸⁹ CALI exercises are useful supplements to law school learning, but are probably somewhat lower in the level of educational efficacy that that provided by an on-going customized assessment. They are particularly useful to faculty who cannot find the time to prepare regular customized assessment of a class using an assessment module.

⁹⁰ It should be noted that the team did not establish ground rules regarding civility of anonymous posting of e-mail messages. While it encountered no problem with these issues, it is probably a good idea to establish such ground rules.

⁹¹ 8th Cir. R. 28A(d), available at, <http://www.ca8.uscourts.gov/newcoa/coaFrame.html> (click on "Rules and Publications," then click on "Local Rules of the Eighth Circuit NEW-Effective December 2002"). Additional current instructions for filing with the Eighth Circuit are available online. See Court of Appeals Information Search, at <http://www.ca8.uscourts.gov/index.html> (last modified Feb. 21, 2002).

⁹² Some also use e-mail or online discussion groups to facilitate out-of-classroom discussion of the material. A kind of electronic bulletin board, an online discussion group helps participants keep track of messages. "Typically, messages are listed, or 'threaded,' by topic and, within topics, by date and time." Ashley, *supra* note 6, at 558 (quoting Warner, et al., *supra* note 26, at 148). "E-mail and discussion groups might be especially useful for supporting the collaborative activities of students participating in legal practicum courses and legal clinics, preparing for moot court arguments, and discussing cases in a problem-based course." Ashley, *supra* note 6, at 558 (citing Warner et al., *supra* note 26, at 146-47).

⁹³ A similar exercise can be developed through the use of threaded discussions on Blackboard.

⁹⁴ At the time this article was written, it appeared that TWEN had a special program that allowed anonymous submissions and that Blackboard was developing one for release of version 6 of its software.

⁹⁵ The student exam identification number is retained.

⁹⁶ Blackboard, WebCT and TWEN all contain these modules.

⁹⁷ See Thomas, *supra* note 39, at 233 (citing Maria L. Ciampi, *The I and Thou: A New Dialogue for the Law*, 58 U. CIN. L. REV. 881, 881-82 (1990)).

⁹⁸ Experts from around the world can be brought into the classroom for class-wide discussion via a chat room. Furthermore, the experts can communicate and share information with the students without imposing on the educational institution the normal costs associated with the expert's travel and related matters.

⁹⁹ See Concord University School of Law, <http://www.concordlawschool.com> (last visited Jan. 7, 2003).

¹⁰⁰ See Robert E. Oliphant, *Will Internet Driven Concord University Law School Revolutionize Traditional Law School Teaching?* 27 WM. MITCHELL L. REV. 841, 860 (2000) (providing a fairly detailed description of the Concord chat room experience).

¹⁰¹ See Real.com – Real Player is now RealOne Player, at <http://www.real.com/?pv=11> (last modified Jan. 2, 2003).

¹⁰² Faculty members using traditional software are sometimes challenged for control by students, who view a chat room as an opportunity for “serious fun” rather than a place for “dreary pedagogy.” Concord's software has solved this issue by leaving complete control in the hands of the professional educator.

¹⁰³ Survey of the William Mitchell College of Law experimental “hi-tech” section students, *supra* note 1.

¹⁰⁴ Associate Dean of Skills at William Mitchell, Debra Schmedemann, has observed: “There are other additional explanations for the cohesion among the section 3 students. One is self-selection: people who chose to be in the experiment probably share certain personality traits, e.g., flexibility. Another is the experimental effect: people knew they were doing something unique, experienced additional faculty and administrative investment, etc. I think social science would support both of these theories. Neither is necessarily better than yours, of course.”

¹⁰⁵ Saxer, *supra* note 41, at 24 (citing Thomas, *supra* note 26, at 240).

¹⁰⁶ Saxer, *supra* note 41, at 24 (citing Thomas, *supra* note 26, at 240-41).

¹⁰⁷ See generally Cheryl M. Herden, Note, *Women in Legal Education: A Feminist Analysis of Law School*, 63 REV. JUR. U.P.R. 551 (1994) (asserting that the impersonal atmosphere and traditional manner of instruction in many law classes cause female law students to learn passively and to fail to question their professors and their education).

¹⁰⁸ Survey of the William Mitchell College of Law Writing and Representation Course (copy on file with author). Faculty conducting the WRAP survey include: Associate Dean of Skills Deborah Schmedemann and Professor Kenneth Kirwin.

¹⁰⁹ Survey of the William Mitchell College of Law WRAP, *supra* note 108.

¹¹⁰ Survey of the William Mitchell College of Law experimental “hi-tech” section students, *supra* note 1.

¹¹¹ The three remaining sections were taught in the traditional fashion.

¹¹² When training does occur, the most successful efforts are those administered in a non-threatening, positive training environment such as private, individual in a faculty member’s office. Group faculty training is very difficult.

¹¹³ There are other ways in which a college can encourage computer usage. For example, making an Information Services person readily available to handle minor repairs or other questions is very useful. Creating a computer help e-mail program that is staffed by experienced computer users is another helpful measure.

¹¹⁴ If funding is an issue, TWEN and Blackboard can also be created by law faculty without the need to purchase an interface by going to the LEXIS or WESTLAW law school web site and registering.