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One Professor's Approach to Increasing Technology Use in Legal Education

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I. INTRODUCTION

{1} Legal educators must increase the use of technology in legal education today [1]. Although some legal educators may disagree vehemently with this statement, [2] most have accepted the fact that technology has and will become an even greater part of the fabric of our learning institutions. [3] Students in kindergarten spend some portion of their week in the computer lab. By the time kids reach their middle- and high-school years, many are well-versed in word processing programs, e-mail, and surfing the Internet. [4] Elementary school teachers are trained and encouraged to use multi-media software, the Internet, and other technology in their classrooms because not all students learn effectively using only auditory skills, nor do all students respond to a "chalk and talk" teaching style. Undergraduate professors in business, science, religion, and other subjects commonly use presentation software to illustrate substantive concepts with formulas, maps, and text. Students are encouraged and trained to utilize technology in class projects and presentations. [5] Most law schools, however, are far behind the educational systems that send us our students in terms of integrating technology into the learning process. [6] Certainly, legal educators have had WESTLAW and LEXIS/NEXIS at their disposal for years, but these tools do not demonstrate a commitment to technology. Even these automated legal databases have at times been viewed with scorn or caution by law professors and legal professionals. [7] Law professors are rightfully concerned that students may rely on automated search techniques without understanding how to research a case or statute in the bound books. Similarly, some law firms would rather bill associate hours than bill clients for LEXIS or WESTLAW search charges. Law students, however, need to recognize the important role that technology plays in our society, and academicians should be the ones to guide them. [8]

{2} The legal profession's resistance to change, at least in the technology area, is rapidly weakening. [9] Law firms are employing technology to reduce the need for support staff, increase communication speed within and without the firm, manage large amounts of information, and expand research capabilities. Law firms are also utilizing technology to communicate more effectively with clients and juries. [10] For example, the televised O.J. Simpson trial dramatically illustrated the use of multimedia in the courtroom. [11] Legal

education must acknowledge the legal profession's decision to embrace technology and prepare law students for a professional life enhanced by its use.

{3} The purpose of this article is to encourage the use of project management principles, which are commonly used by information systems departments, to implement technology as an integral part of teaching and learning in legal education. The goal is not to convince you that any certain technology is "a must" for every classroom or institution, even though this author believes that most of the technologies discussed in Part II will eventually become part of the law school culture as a reflection of our society. Although there is adequate information from various sources[12] to guide the reader in an examination of available technologies, Part II of this article describes briefly the pros and cons of currently available and employed technology, as well as new and potential technology. Part III describes a process used by information systems organizations to convert institutional operations to automated systems and to upgrade existing administrative computing systems, and encourages using such a process to increase technology use by faculty members in educational institutions. Although the focus of this article is on law schools, this same process can be applied to undergraduate faculty, and even to law firms. Admittedly, not all types of technology may be desirable in a given law school environment at this time, and the resource commitment to implement this process may not immediately be forthcoming in all institutions. When a law school determines, however, that it is committed to exploring a particular technology because of its advantages, the process proposed by this article should achieve the most successful results. Part IV concludes by encouraging legal educators to increase technology use in legal education.[13] The first step in that direction is to systematically evaluate individual faculty needs and assist the faculty in meeting those needs using project management tools. Doing so will avoid the unfortunate tendency to drag people into technology by purchasing software and hardware tools, only to have these tools become outdated before they are ever used.

II. TECHNOLOGY IN LEGAL EDUCATION: THE PROS AND CONS

A. Computer-Assisted Legal Research and Expanded Law School Services

{4} Two major legal online services, LEXIS and WESTLAW, provide powerful research tools to the legal community by maintaining databases of cases, statutes, legal scholarship, and news publications, along with sophisticated indexing and search capabilities. This technology has been widely accepted by the United States legal and academic communities,[14] although some legal educators and practicing attorneys may be concerned that the reliance on these technology tools has resulted in a decrease in knowledge and understanding about legal research techniques using hard copy books and documents.[15] While the cost of accessing these online services is burdensome for both large and small law firms, law schools receive large discounts from the service suppliers to encourage student and faculty use. By 1990, both LEXIS and WESTLAW offered account passwords to law students in the United States. These accounts are paid by the law schools at greatly reduced contract prices, which allows students to utilize these services "unrestricted by past limitations such as inadequate library resources or prohibitive costs." [16] As more source materials are included in these databases, the need for traditional library acquisitions and physical library space in both law school and law firm libraries should decrease. This decrease in physical library costs may eventually offset the online systems costs for law firms. Currently, however, law school libraries remain under pressure to retain and acquire physical books for accreditation purposes and school ranking systems.[17] Additionally, the continued success of LEXIS and WESTLAW as legal research databases also will be challenged as more public documents are published on the Web and Internet searching capabilities improve. However, because these two companies enjoy a dominant presence in the market, if more "publicly available" information should begin to surface, these two services will simply offer a better way to access that information through their services. A final outcome of delivering legal information to the general public via the Internet is that courts and other adjudicatory bodies will recognize that they are reaching a new audience and will begin to write with more clarity and structure for the medium.[18]

{5} Within the last two to three years, WESTLAW and LEXIS have expanded their online legal services to include Web-based support for legal educators. The West Educational Network ("TWEN") and the Virtual Classroom (based on "Web Course in a Box") offer law professors the opportunity to establish a computerized tool for their law courses that facilitates communication with students by allowing online uses such as posting syllabi, course assignments, documents, presentation materials, and maintaining class discussion lists.[19] These tools may not be as flexible as using a webpage created by the professor and there are concerns that they induce "student reliance on a particular commercial vendor,"[20] but they enable professors, who may not be technologically savvy, to utilize Web technology without a great deal of time or effort.[21] As software developers enhance their products to take advantage of Web technology, standard office packages will provide the tools necessary to easily load information onto the Web with a minimum storage capacity requirement. For example, Microsoft Office 2000 already makes the Web more accessible to almost every user by incorporating a command in the word processor to "save this document as HTML." [22] These software developments may significantly impact the continued success of either TWEN or the Virtual Classroom.

B. Computer-Assisted Legal Instruction

{6} Computer assisted instruction ("CAI") for legal education was conceived in the 1960's by several law professors, but actual use of CAI exercises did not begin until the early 1970's.[23] In 1982, the University of Minnesota Law School and Harvard Law School joined together to establish the Center for Computer-Assisted Legal Instruction ("CALI"), which has a current membership of approximately 170 schools.[24] The majority of these member schools are located in the United States, but CALI also has affiliates in Canada and Italy.[25] Additionally, British, Irish, Canadian, and Australian law schools have established organizations and instituted projects devoted to CAI course development.[26]

{7} It has not been conclusively established how effective CAI is in meeting certain basic legal education goals, such as learning black letter law.[27] A large body of literature focusing on CAI for nonlegal instruction, however, supports the conclusion "that CAI, when employed in college classroom teaching, may improve learning while significantly and consistently reducing the time needed for instruction." [28] Thus, available evidence does indicate that CAI can achieve the goal of learning black letter law.[29] Studies have also indicated that students enjoy learning via the computer because they may learn at their own pace. Furthermore, such learning technology enhances student self-confidence because it lowers student anxiety and inhibitions over answering questions, increases retention of material, and ensures that students fully understand the material before advancing to new material.[30] However, two other basic goals of legal education - understanding the rationales underlying the law and learning to think independently - may not be helped significantly by CAI.[31] Some educators believe that these exercises may actually work against these larger legal education goals, even though they may be helpful to students learning basic legal principles.[32]

{8} Skepticism concerning CAI effectiveness in the legal education process and problems with program development have held legal educators back from embracing this technology. Most professors lack, or rather, think they lack, the necessary expertise to create effective CAI exercises.[33] Furthermore, a significant time investment is required to create CAI exercises, and untenured faculty members may not be willing to risk such an investment at the expense of traditional scholarship requirements.[34] It cannot be stressed enough that this concern about time investment for untenured faculty members also affects the development and deployment of other types of technology. Finally, the cost for the equipment necessary to support both the creation and the use of CAI software may be a barrier to the integration of this particular technology into academia.[35] Even though CAI has been the dominant technology in legal education for the past twenty-five years, it "has never achieved the promise envisioned by its proponents, despite the admirable efforts and support of a national organization and the availability of numerous software programs and tutorials." [36]

C. Word Processing

{9} Another early form of law school computing, word processing, has provided legal educators with a valuable tool for producing legal scholarship, preparing class notes, classroom "overheads" (or transparencies), and student handouts.[37] Law professors utilize word processing by directly composing on their own computer, by handwriting documents that are later converted to a word processing document by a faculty secretary, or by a combination of both methods. The use of word processing programs has also allowed law reviews to streamline their publication processes by facilitating data file electronic transmission, as well as by making the editing process easier and faster. Although, some may argue that word processing has not necessarily had a beneficial impact on legal scholarship, "it is clear that virtually all students, faculty, and staff in law schools use computers to write." [38]

{10} Students use word processing to prepare case briefs, class outlines and study aids, and legal research and writing projects. Further, students increasingly use notebook and laptop computers to take notes during class.[39] There is some concern that students who take notes on their computer are less likely to participate in class if they attempt to capture verbatim what is said by their professors.[40] This tendency can be counteracted for beginning students by "emphasiz[ing] Socratic discussion and analysis of hypotheticals over lecturing," stopping class discussion or a lecture to remind students not to take "stenographic" notes, or even by sharing the professor's notes with students before or after class.[41] Increased computer use in the classrooms has presented additional challenges to law schools such as figuring out where all of these computers can be plugged in, keeping clicking keyboards from distracting other students,[42] interfacing the professor's technology use in the classroom with the students' computers,[43] and controlling game playing during class hours.[44]

{11} In fact, "[s]ome schools already require entering students to purchase laptop computers; others are debating whether to do so." [45] Requiring students to own laptops reduces the need to supply lab computers and allows the laptop cost to be included in a student's financial aid package.[46] However, requiring students to purchase laptop computers will greatly increase the support level needed from computer staff, in order to configure individual student computers to work with the school's network and to provide additional technical support as needed.[47] Most schools likely do not currently have adequate staffing to meet such an increased demand for technical support.

D. Law Review Publication Process

{12} Since the advent of word processing, law reviews have made extensive use of computers to publish their journals.[48] In addition to using computers to prepare and edit articles for publication, law reviews have also been using desktop publishing to substantially prepare journals "in house" and reduce outside printing charges. As an alternative to publishing a hardcopy journal, some law schools have instituted electronic publications, which are produced and distributed using Internet capabilities.[49] This electronic publication method saves costs for the institution, and as a result, may allow additional special interest journals to enter the legal scholarship world.

{13} Law reviews are already requiring authors to submit their documents electronically, once they have been accepted for publication. Some reviews are now sending electronic acknowledgments of receipt for article submissions. Hopefully, all law reviews will eventually accept submissions electronically. Other professors and students might post their articles directly to the Web. Using the Web as a publishing platform offers several advantages over traditional publishing, including hypertext links, audio and video capabilities, and the creation of a public forum to discuss the article.[50] Web publication also offers an opportunity for publishing articles that might not otherwise be published because the normal process of editorial selection is bypassed. This opportunity to publish can allow a radical idea that normally would not get published to be

seen by anyone in the world! However, this exciting feature of the Web may also diminish the overall quality of legal scholarship and may allow radicals and fanatics a wider audience than they might otherwise attract.

E. Examinations and Grading

{14} For years, most, if not all, law schools have allowed students to take examinations using typewriters. With the arrival of word processing on personal computers, students were anxious to use this technology. Concern that students would be able to access data from their hard drive or memory during the examination process, prompted law schools to prohibit student computer use for exam-taking. Instead, some schools attempted to provide controlled computer facilities for essay format final examinations.[51] In the past two to three years, software has become available to disable retrieval capabilities on individual student personal computers so that students can take essay examinations on their own computers without school officials worrying about electronic cheating.[52] This author's institution utilizes the ExamSoft product, which allows electronic exams to be printed out and then distributed to the professors for grading, along with the handwritten "bluebooks" from the other students. Allowing students to use computers to take exams makes the exams easier for professors to read and easier for the students to write.[53] There are some disadvantages, however, in allowing students to utilize computerized exam-taking technology. Although the software is quite sophisticated, there is still the possibility of an exam being lost or otherwise unrecoverable. In addition, in the near future, students may not be able to take the bar exam using computers[54] and equitable considerations, such as equal access to technology among all student, are still concerns.[55] Nevertheless, with this new technology, professors may soon be viewing and grading exams online and an artificial intelligence-based software program may be grading essays based upon a pre-prepared grading key.

{15} Multiple choice examinations have been graded and scored electronically for years using scanning hardware and software. Spreadsheet programs such as Excel also can be used for essay exam grade distribution using median and mean calculations based upon the input of raw scores. Professor Bob Popovich, [56] from Pepperdine School of Law, has developed a Windows-based program which allows raw scores for essays, as well as for multiple choice exams, to be distributed along a grading curve. The program requires the professor to indicate whether each exam part should be distributed separately or distributed based upon all parts, as well as, the desired median, top score, and low score. The program then mathematically distributes the scores according to these parameters. Parameters can be modified as necessary to attain the appropriate grade distribution for the course. Finally, a grade roster is produced for entry into the records office. The new ExamSoft product, mentioned above, also has grading capabilities available to professors. Although it is likely that professors and their respective institutions have different methods for dealing with the grading process and the uniformity of grades, technology can greatly reduce a professor's burden in performing the tasks associated with the grading function.

F. Electronic Casebooks

{16} In the early 1990's, the electronic casebook made its entry into legal education using Folio Views as the platform to develop fully electronic course materials with the ability to search, cut-and-paste, and create hypertext links that allow users to easily access related text and information.[57] Using Folio Views, Premise, or RoboHELP[58] as the software platform, casebook authors are able to add, delete, or rearrange cases with ease and to embed links and paths through the material to connect to interactive electronic lessons, statutory codes, online databases, word processing, or other electronic casebooks.[59] Students are provided with an electronic casebook that is similar in appearance to the printed text with page numbers, tables of contents and indices.[60] Additionally, powerful search features, text highlighters, and the ability to insert personal notes are provided to the user.[61] Some of the drawbacks of the electronic casebook, such as the difficulty of reading material from a computer screen,[62] difficulties in providing or obtaining student access to computers and a network, and the time involved to train students and faculty in this technology use may be

overcome with the passage of time, training, and familiarity with reading material online.[63] The electronic casebook technology, however, may become obsolete before these difficulties are resolved. At least one commentator has speculated that, "the potential to use the Internet itself as an online casebook, replete with cases, statutes, hearing reports, and other materials, may enable ambitious professors to skip the electronic casebook stage entirely." [64] In fact, since April 1999, West has offered professors a service for selecting, compiling, and distributing course materials using West Group content, such as cases, statutes, and select West Group and Foundation Press casebooks.[65]

G. Multimedia

{17} Multimedia technology can be used to instruct, entertain, and influence people, in the classroom, courtroom, and workplace. In the classroom, a laptop computer can be connected to a projector to create an electronic blackboard. There is also an interactive electronic whiteboard product that allows an instructor to write directly onto a physical whiteboard and to create digitally-displayed images.[66] These electronic displays allow instructors to present material visually and guide class discussion by displaying hypotheticals, crucial passages from cases, statutes, other authoritative materials, and the conceptual framework the instructor has imposed on the material.[67] For those professors who already use visual aids, such as the blackboard/whiteboard, handouts, or overhead transparencies, this technology allows for advance preparation of visual aids in a visually pleasing format. Presentation packages allow professors to choose different templates, colors, fonts, and add ClipArt images, animation, photos, and even video clips. Word processing software can also be used to allow the professor to quickly and easily make changes to displayed material. Professors can make these presentations available to students in electronic format prior to class or afterwards so that students can concentrate on class discussion, rather than worrying about transcribing what is being displayed in the classroom.

{18} A professor who prefers to wander the classroom to retain his or her teaching style when introducing multimedia into the classroom, should try using an "air" mouse in conjunction with an electronic presentation. This device allows the user to move through each bullet point and to change the slides without being physically connected to the computer. Although some "air" mouse products use infrared technology, this author prefers using a wireless radio mouse by Logitech.[68] It has an easy-to-use trackball motion and a range of about thirty feet, which allows for free movement about the classroom without worrying about the computer's location.

{19} Electronic presentation of material can be especially effective in courses that require the application of formulas to problems, such as for future interests study or marital property distribution.[69] This technology, however, can detract from the Socratic style of teaching if not used properly. To avoid detracting from classroom instruction when using presentation packages, one should provide students with the projected material in advance via TWEN, Virtual Classroom, or a Webpage to eliminate the students' perceived need to copy the projected material verbatim. Furthermore, projected material should be restricted to basic points or issues designed to help focus class discussion and to actually enhance Socratic dialogue.[70]

{20} Additional considerations for using this technology include equipment cost, physical classroom layout, and preparation time.[71] High-intensity projection systems are available to project clear, sharp images in classrooms without having to dim the lights or retrofit classroom lighting. Ideally, these projectors should be mounted in the ceiling so that instructors do not have to worry about peripatetic styles that interfere with projection. This equipment is costly, however, and is constantly improving, creating the need to replace such equipment every two to three years. Portable projectors are an option, but cumbersome, as they must be delivered to the classroom, set up, and then picked up after class.

{21} The initial preparation time for these presentations is also a consideration, particularly when choices must be made between spending time on scholarship and spending time on improving class instruction.

Generally speaking, a legal educator will need to spend approximately forty-five minutes to one hour to prepare the basic presentation portion for a one- hour class session, assuming the educator is familiar with the presentation software package. Adding photos or video clips to the presentation will take considerably longer, particularly since the source material preparation requires special equipment such as scanners and video capture technology.[72] However, the use of photos, video, and audio can greatly enhance the learning experience, providing students both a unique perspective on the material and just a little bit of entertainment. [73]

{22} Students' reaction to technology use in the classroom has been mixed. Many students find that the visual and organized course presentation is helpful in following class discussion, note-taking, and preparing course outlines. Even though the presentation does not outline black letter law, but merely presents questions for discussion, students appreciate the visual guidance this technology offers to help them absorb class material. Some students, however, find technology to be distracting and a hindrance to class discussion. Certainly, flexibility in classroom discussion is one issue that needs to be addressed when presentation software is used. In order for presentation software to replace the flexibility of the chalkboard, software must be improved to allow a professor and his or her students to wander away from a prepared analytical route to explore side issues. Although current packages allow some flexibility for the varying of a presentation outline, these features are not yet developed to the point where they match the immediate and spontaneous capabilities instructors have enjoyed with chalkboards. Above all, professors must ensure that their technology use in the classroom does not detract from their ability to teach students how to think like lawyers.

{23} In addition to using technology in the classroom to enhance student learning, legal educators must also train students in how to use technology to enhance their future practice of law. Some law partners now utilize presentation technology to pitch their law firm to prospective clients or to communicate with existing clients about the progress of a particular legal matter. Increasingly, technology is being used in the courtroom to effectively display documents, photos, and other items to the judge or jury.[74] Computer forensic evidence, animations, simulations, and accident or crime scene reconstructions are being offered as demonstrative evidence in litigation.[75] Our society relies widely on visual media in the form of television, videos, and computers to receive information. Therefore, it is no surprise that jurors will feel comfortable receiving information in the courtroom utilizing this technology and may even expect such visual displays. [76] Recent studies indicate "that juries remember ... [eighty-five] percent of what they see as opposed to only ... [fifteen] percent of what they hear," [77] so jury retention of key information will be increased by visual displays in the courtroom. [78] Students who know how to use this technology in the courtroom will be more competitive in the job market. [79] Therefore, technology instruction should be integrated into either moot court programs, trial and appellate advocacy courses, and litigation preparation and settlement courses, or special courses in modern legal technology should be added to the curriculum to supplement the traditional litigation courses. [80] In addition to teaching students how to effectively use multimedia tools, these courses should include technology training in areas such as Internet use for research and client support, e-mail communication, and litigation and document management software.

H. Electronic Mail and Discussion Lists

{24} Electronic mail was developed and first used in the 1960's and early 1970's, [81] but it was not used to a significant degree until the early 1980's with the introduction of automated office systems. Electronic communication was not widely accepted in legal education until the early 1990's when personal computers became more commonplace and were networked together within the academic community. Today, in many law schools, e-mail systems have become the primary means of communication. [82] E-mail is used for general announcements and communications to the law school community and for informal and formal contacts between individuals and within departments. Because document transmission can be accomplished by sending files via e-mail, information can be distributed rapidly and without printing. E-mail is also used to

schedule committee meetings and to distribute minutes. In addition to facilitating rapid communication within the law school community, e-mail capabilities can be used to contact alumni, "organize conferences, initiate scholarly discussion of substantive topics, and foster collegial communications and substantive interaction with law school faculties worldwide." [83] Its social impact is significant because it serves as the new office water cooler, allowing people to socialize informally and efficiently. [84] Additionally, e-mail is, by its nature, "an egalitarian form of communication," thereby reducing the hierarchical distinction between professor and student and encouraging cooperation and the sharing of ideas. [85]

{25} E-mail technology can also be used to establish electronic discussion groups and to create a forum for idea and information exchange. These discussion groups or lists can be used to facilitate organizational and administrative communication for project teams and committees. The most common uses of these lists in legal education and in the legal community at large, however, is to support discussion about substantive legal issues in special areas of interest. For example, LAWPROFS is an electronic discussion list for law professors, while DIRT is a discussion list for both real property professors and non-academic lawyers, brokers, real estate agents, title insurers, and lenders. [86]

{26} Discussion lists are also used for law school classes to involve both the professor and the students in a continuing discussion of legal issues outside the classroom. These classroom discussion lists benefit all students, both the active participants in the electronic discussions and the "lurkers." [87] Professors Warner, Sowle and Sadler in their article, *Teaching Law with Computers*, [88] refer to this use of technology as expanding the walls of the classroom. [89] The phrases "virtual classroom" or "borderless classroom" have also been used to describe these discussion groups. [90] Students are encouraged to continue discussions without taking up additional class time and professors may use the list "to pose additional hypotheticals, address policy considerations or doctrinal subtleties . . . , and clarify areas about which students seemed confused." [91] These e-mail lists provide an excellent tool to supplement the classroom experience and to provide those students, who hesitate to participate actively in class, with the opportunity to communicate in a less threatening or possibly even anonymous environment. [92] Electronic classroom lists, however, may discourage office visits, [93] thus, reducing the human contact between the law professor and student [94] and increasing the likelihood that the student, as an attorney will be alienated "from the human client, from the community, and even from himself." [95] Nevertheless, it can be argued that even legal clients may prefer communicating with their lawyers using e-mail because communication can take place outside standard business hours and clients may get faster responses. [96] This technology can actually increase the amount of interaction that clients have with their attorneys.

{27} Finally, an additional concern for professors is that these discussion lists will likely increase the time a professor devotes to communicating with students, as well as the time a professor spends sorting through and digesting information arriving through external discussion lists. Both students and professors may find that this supplemental technology creates an "information overload" situation. [97] However, when information is electronically recorded, it can be managed by using the computer to help "filter" information that is not critical to a student's understanding of the course material, nor necessary for a professor's continuing legal education in specialized areas of the law. For example, Enfish Tracker is a new product, specifically designed to help cure information overload by monitoring all of an individual's information sources to locate, prioritize, cross-reference and display information in an organized environment. [98] This software can be used by professors to keep track of information in specific subject areas by allowing the computer to actually read everything received electronically from all different sources, and then filter and organize this information.

I. The Internet

{28} The Internet is a network that links together individual networks from around the world. It enables a

user to access information contained on networks worldwide using the World Wide Web ("WWW" or "Web"), a hypertext medium, and a browser application, to quickly link electronic documents to one another. [99] The growing availability of web browser software, first developed in 1993, has contributed to the rapid development of this worldwide technological phenomenon. [100] Although legal educators have been slow to embrace computer technology, the Internet has the potential to play an integral role in legal education. [101] Professor Michael Geist from Columbia Law School, in his article examining technology use in legal education, [102] observes that, "[a]lthough the Internet is currently only in the early stages of its development, it is already showing signs of overtaking CALR, CAI, and electronic casebooks by providing users with the capabilities of all three ventures in one user-friendly and powerful system." [103] Activities in this area include the Environmental Law Virtual Guest Speakers Program/Discussion List and the Environmental Law Teachers' Clearinghouse set up for environmental law teachers by Professor Stephen Johnson of Mercer University School of Law. [104] Another innovative venture in legal education on the Internet is WebBuzz, announced by Professor Michael Geist in March 1999; it is a topical web lecture on the LEXIS Legal Education website featuring current issues in technology and the law. [105]

{29} While the Internet's potential for enhancing legal education is enormous and exciting, there are several shortcomings. [106] First, law schools have not yet developed a web culture. [107] Some students may be unable or averse to accessing materials electronically and faculty may be slow to developing such materials due to time constraints, lack of technical support, or unfamiliarity with the technology. [108] High speed network connectivity and reliability are critical to the effective use of technology and "a negative experience on the Internet may well deter students [and faculty] from engaging in repeat visits." [109] These shortcomings will be addressed as the Web "enmesh[es] itself into the fabric of the law school experience," [110] in the same way that electronic mail and CALR have rapidly integrated into legal education. Indeed, it is critical that law schools embrace the Web, as it becomes the institution's face to prospective students, alumni, the legal community, other legal educators, and current members of the student body, faculty, and administration. [111]

{30} The pioneers in legal education technology have already provided the rest of us with examples of how the Internet can be effectively used to enhance legal education. [112] JURIST: The Law Professors' Network, a website established by Professor Bernard Hibbitts of the University of Pittsburgh, allows law teachers from all over the world to compare notes on using the Web for classroom teaching by accessing the educational webpages of law teachers. [113] Yet, despite these innovators' successes in integrating technology and teaching, implementing new teaching tools as part of the law school culture will require commitment, planning, time, and technical resources. Such implementation may also require legal educators to fundamentally reconsider their longstanding methods of legal instruction. [114]

J. Distance Learning

{31} Distance learning allows students from all over the world to attend a distant law school without the trouble and expense of leaving home. [115] Video conferencing technology or Internet conferencing systems can be used to conduct virtual classroom sessions in "real time" and to allow instructors "to teach students who are geographically dispersed." [116] One major advantage of this technology is that it allows easy access to legal expertise to support curriculum requirements. Instead of using visiting professors, adjunct professors, or the "least-unqualified" resident professor to fill curriculum needs created by retirements, sabbaticals, or other factors, the school can arrange to have a course covered using distance learning from a fully-qualified faculty member at another institution. [117] Additionally, specialized courses that generate low enrollment can be added to the curriculum using distance learning, without diverting existing teaching resources. [118] In fact, the advantages are numerous, as "[s]chools may pool or share their resources to reach a greater number of students" and, "[a]s a result, students have greater access to a variety of instructors, including experts at universities and in the private sector." [119] Another distance learning advantage is that it exposes students to

other law school communities.[120] This contact allows students to experience different "[a]ttitudes, customs, cultures, and expectations" from across the country or internationally, and may help them to understand these differences when dealing with their future clients.[121]

{32} A major disadvantage of this distance learning technology is the loss of physical proximity between professor and student. This loss of physical interaction in the classroom not only has the potential to affect the educational process by impacting interaction, spontaneity, and group dynamics, but it also has the potential to impact the legal profession by reducing the professor's role in modeling intellectual, professional, and ethical values.[122] Indeed, technology's depersonalizing aspects breed both physical and social isolation, which may, in turn, intensify the deteriorating relationship between attorneys and their clients and communities.[123] At this point, it is difficult to imagine that distance learning will become a widely-accepted alternative to "traditional" legal education. Nevertheless, Concord University School of Law opened its "cyber doors" to students in the fall of 1998 to become the first completely online law school. While not yet accredited by either the state bar or the American Bar Association ("ABA") [124] the ABA has recognized that this technology may enhance legal education and has encouraged experimentation with distance learning by publishing temporary guidelines to facilitate these experiments.[125] U.S. Supreme Court Justice Ruth Bader Ginsburg, in her remarks at the dedication of the Rutgers Center for Law and Justice in September 1999, expressed unease at the prospect of a student getting a J.D. "without ever laying eyes on a fellow student or professor." [126] Instead, she encouraged legal educators to "strive to ensure that the Internet remains a device for bringing people together and does not become a force for isolation." [127]

{33} Virtual classrooms offer the "potential for a unique and interactive learning experience" by bringing students from different law schools into a single environment.[128] By eliminating logistical problems, such as finding appropriate meeting times, places, and physically transporting people, personal interaction may be strengthened by using technology. Adding visual information to these electronic meeting places through the use of video-conferencing enhances this interaction. The value of personal contact between the instructor and the student, however, should not be lightly disregarded, and a commitment to the importance of such contact should limit distance learning use to those situations where "live" instruction is either economically or physically impossible, or alternatively, where the benefits in pedagogy achieved by its use outweigh the disadvantages. As we integrate technology into legal education, we must ensure that it is used to enrich teaching, not to replace it.[129]

K. New or Developing Technologies

{34} Artificial intelligence is a technology that has not yet succeeded in replacing sophisticated legal analysis.[130] In 1994, one commentator noted that, "[t]o date, the use of artificial intelligence to mimic the decisional process of judges or lawyers has not been achieved; it may never be achieved." [131] In 1998, at the brink of the new millennium, J.C. Smith, Professor Emeritus of Law, and Founder and Director of the University of British Columbia Faculty of Law Artificial Research Project, observed that, "we do not even have computers which can manage natural language at the level of a two year old infant." [132] Professor Smith suggests that the computer be used to solve difficult tasks related to legal information by having the computer carry out a complicated series of simple tasks, however he concludes that "the human race will never celebrate the birthday of HAL or any kind of artificial intelligence system with the capabilities imagined by Clarke and Kubrick in 2001: A Space Odyssey." [133]

{35} Even if it cannot replace sophisticated legal analysis and argument, artificial intelligence technology can "serve as a tool to enhance the capability of the human lawyer." [134] Automated practice systems and work product systems are now utilized to improve the efficiency of repetitive services such as preparing tax returns, estate planning, and preparing divorce agreements.[135] Lawyers are increasing their productivity using these artificial intelligence tools; however, they may hesitate to call it artificial intelligence and may

instead refer to such technology as "expert systems." [136] Artificial intelligence technology can also be used to locate relevant legal authorities through natural language searching. [137] Given the vast amount of information in machine-readable format, research will be made easier, as the computer is able to analyze volumes of text and to organize it by subject without human intervention. For example, in October 1999, a company in England launched an online database for lawyers and insurers, which contains past court decisions and negotiated settlements and uses artificial intelligence against past laws and the details of existing claims to assist personal injury victims in settling claims. [138] Cyber\$ettle, a somewhat similar service in the U.S., also provides an industry-wide database system for cases that have been settled using their automated dispute resolution system. [139] In November 1999, the Corel Corporation released a new legal suite, WordPerfect Office 2000, with "cutting-edge artificial intelligence and document analysis technologies to allow users to edit, proofread and review complex documents." [140] Finally, it is not beyond hope, especially for law professors, that artificial intelligence capabilities may one day allow instructors to input a grading key for essay examinations against which student answers can be automatically evaluated.

{36} Speech recognition systems, yet another such technological advancement, are aiding lawyers and professors in capturing their thoughts and analyses in electronic form. [141] Lawyers are able to dictate into a digital voice recorder and to have their speech instantaneously transcribed for them and ready for final editing. [142] Soon, depositions will also be taken with speech recognition technology and note-taking in classes will take on a new meaning, as this technology will allow a lecturer's speech to be almost instantly transcribed while the class is taking place. Although this technology will not eliminate the need for lawyers or law professors to have some computer experience, it will increase their productivity and will help "level the field" among those who do not type well, who do not want to type, or who are physically unable to do so. Indeed, speech recognition technology is already being used by some disabled law students for preparing outlines, writing papers, and taking exams. [143] Finally, speech recognition technology in the future may allow for research which is very difficult to do right now, such as searching for information held on video that has not already been reported or transcribed. [144]

III. HOW TO INCREASE THE USE OF TECHNOLOGY IN LEGAL EDUCATION

A. Identifying the Mission: The Basic Goals of Legal Education

{37} Before technology can be effectively incorporated into legal education, basic legal education goals must be identified so that educators can make sure that technology will help us achieve these goals. For example, educators cannot allow the impersonal aspect of computers to hinder attempts to make "the law classroom a more human place, and law practice a more human enterprise[.]" [145] In addition, there is not much evidence that the expense and effort involved in using technology can be justified by a resulting improvement in student learning. [146] So what is it we are trying to accomplish as legal educators? Assuming that traditional legal instruction, in the form of an interactive exchange between the professor and students, will remain the essence of our educational process, we will base our goals on the understanding that law professors will continue to teach, for the most part, the way they have in the past. [147] No matter what, legal educators must recognize that they are teaching students to think like lawyers by sharpening their ability to think "rationally, logically, and dispassionately." [148] Legal educators teach students "critical analysis, synthesis, and writing skills to apply legal rules to new fact patterns." [149] By pulling together various core materials during the course outlining process and by understanding legal issues and rules in preparation for exams, students acquire the "intellectual skill needed in practice to interview clients, analyze and synthesize the law, advise clients, and argue persuasively." [150] Achieving the basic goal of teaching the student to think like a lawyer requires using three widely-accepted pedagogical goals: (1) facilitating a basic knowledge of black-letter rules; (2) helping the student to understand the rationales underlying the rules; and (3) "developing the [student's] ability to analyze legal issues independently." [151] Computers can be used to aid "our most conventional classroom activity: lectures and Socratic discussion," [152] while at the same time, enhance

student learning outside the classroom.[153]

{38} Finally, legal educators must not forget that in addition to teaching students to think like lawyers, they are also teaching students, by example and role modeling, how lawyers should interact with society. It is an opportunity to communicate with future lawyers, either directly or indirectly, the importance of values, character and morals.[154] Therefore, how instructors use technology to enhance the learning process will influence students in their approach to technology as future lawyers and business leaders. Legal educators have an obligation to ensure that students are not only prepared to think like lawyers in a modern and technological society, but also to use technology in a way that enhances their human relationships with their clients and society.

{39} This is the starting place for technology integration into legal education. A school must have a mission statement or a basic statement of goals established to guide itself through the implementation process. Once the overall academic mission has been set, the next step is to establish the organization and resources necessary to accomplish these goals.

B. Establishing the Organization: Who Are the Players?

{40} Assuming that you have determined the need to integrate technology into legal education,[155] the faculty and the administration[156] must be involved in the process. First, the university's administration must be willing to commit the resources necessary to accomplish the goal of integrating technology into the institution. The resources required include both the technological costs -- computer hardware and software -- and the personnel costs -- staff and staff training. Integration cannot be successfully achieved by recognizing only the technical side of this resource equation. Purchasing more equipment and software and then mandating that faculty employ a particular technology, such as e-mail or webpages, will not produce successful results. The institution must provide faculty with appropriate staff support and actively involve faculty in the change process so that they will take project ownership. Having a few faculty "champions" can be helpful to the change process, but these pioneers are not enough to achieve the overall faculty investment required for a successful integration.[157] There must be a supportive and understanding environment if faculty members are to be convinced that they are responsible for integrating teaching and technology, which will facilitate the instruction of students in how to perform like lawyers in a technology world. By employing system design, development, and implementation techniques, the law school community will become invested in the technological integration process.[158] This systems approach requires that the institution establish goals, assess the needs of each faculty member, identify and select the appropriate technology to meet the stated needs, prepare an implementation plan, and manage the project using project management techniques.[159]

{41} Faculty members must be provided with the resources to accomplish this investment in change. Those who are excited about technology use should not be forced to bleed on the cutting edge alone. Weaving technology into the daily class preparation, student contact, and classroom performance should not be a function performed solely by the individual faculty member. With scholarship pressures and keeping informed about changes in substantive areas of the law, most faculty members do not allocate the time necessary to experiment with new technology, nor do they successfully incorporate this technology into their courses.[160] Technology buffs must remember also that most legal educators were trained in law, not computers, and many have functioned successfully for years without technology use.[161]

{42} In most law schools today, the law library is responsible for academic computing. There is a trend to change the library director's title to a new title, such as Associate Dean of Library and Information Technology,[162] to reflect the library's increased responsibility for technology support. Therefore, the law library seems to be the most appropriate location for establishing a project team to support a technology integration project. Of course, institutions must realize that when the library is given the responsibility for

technology in the organization, it must also be allocated a budget that reflects this increased expectation. Appropriate resource allocation is essential for the success of any project undertaken to integrate technology. Unfortunately, most library organizations, as currently staffed, cannot take on this additional technology challenge.

{43} Assuming that the institutions allocates sufficient resources to begin a technology integration project, the project team should ideally consist of a project leader, faculty liaisons,[\[163\]](#) and technical support staff. The team size will vary based on faculty size and the administration's willingness to commit resources. The project leader will be responsible for project management and may function as a faculty liaison as well. The project leader and faculty liaisons ideally should be legal educators themselves, so that they have sufficient knowledge about legal education to work closely with faculty members to assess their needs and to propose appropriate alternatives. Individuals who have simply earned a J.D., however, should also be able to fill these positions. They will have some perspective about the legal education process, albeit perhaps only from the student's viewpoint.

{44} Faculty liaisons should be individuals with strong "people skills" who have the ability and desire to listen to faculty members, to translate faculty needs into solutions (presumably, but not necessarily, technological), and to closely assist faculty during solution implementation. Key qualities of a good faculty liaison include being able to listen without judging and expressing personal ideas on how a professor should be performing his or her job, as well as being able to avoid using intimidating computer jargon. One of the biggest impediments to integrating technology into legal education is the reluctance of individual faculty members to appear ignorant. The faculty liaison must carefully walk the line between talking below the professor's technological level and talking above the professor's knowledge base. Therefore, it is important that the project leader and faculty liaisons be educators first and technologists second.[\[164\]](#)

{45} When this project model is used to implement business systems, the liaisons generally are considered systems analysts, who have familiarity, and sometimes actual experience, with the administrative function being computerized. For example, a former payroll supervisor or accounts payable supervisor can function as a user liaison/systems analyst for a new financial system implementation. It is not necessary for the liaison to have technical programming experience, as long as the liaison understands technical concepts, capabilities, and limitations. In fact, many organizations specifically avoid placing technically knowledgeable people in these positions because these technicians tend to speak to their clients in "computerese" and to impose technological solutions without understanding the actual needs to be met.[\[165\]](#) Similar models have recently been used by school districts to integrate technology into the educational process and these models appear to be working.[\[166\]](#)

{46} The technical support staff for the business systems implementation model consists of programmers and programmer analysts who translate the needs conveyed to them by the user liaisons into actual programming language code or who assist in prepackaged computer software installation, chosen by the systems analysts and the application users. In the legal education project team proposed here, the technical staff should consist of individuals who can implement technology with innovation and competency. Technical support staff do not need legal training and they do not even need formal computer science education, if their technical skills are sufficient to support new hardware and software installation. It is important that the technical support staff, however, be well-acquainted with new technologies so that they can advise the faculty liaisons as to the technological alternatives, either currently-available or forthcoming, to meet faculty member needs. Once a project team has been staffed with the resources to investigate and to implement legal education technology, the third step in the process requires the project team to assess each faculty member's specific needs.

C. Assessing the Needs: The Needs Analysis Report ("NAR")

{47} In order to determine what types of technology should be brought into the legal curriculum, the project

team must "assess the current situation with an eye toward improvement." [167] Faculty liaisons should schedule interviews with individual faculty members and spend several hours, maybe even several days, with each instructor. It may be valuable for liaisons to observe a few classes, read the syllabus, and review course materials to gain an appreciation for the individual instructor's teaching style and substantive area of expertise. This is a time for the professor and the faculty liaison to develop a working relationship of trust and mutual respect and to brainstorm about possible technological innovations that could assist the professor in his or her endeavors. These interviews should be documented and summarized in a NAR for each professor. This NAR will identify the basic responsibilities, functions, and activities of each professor. In addition, the NAR will discuss those areas where the professor and the liaison have determined that assistance or change would be welcomed. Here, the model differs slightly from the one used to implement business applications because only one NAR was necessary for each business application, while here there will be a NAR prepared for each professor. For example, a NAR for Professor William Slomanson at the Thomas Jefferson School of Law would include the need to make his students "more proficient in state motion practice via technology they will use as lawyers." [168] It is in the next two steps that a project team will first identify the ways in which this can be done, such as by using word-processing and email capabilities, and then select the best approach. Other needs identified in a NAR could include goals such as, supplementing the classroom experience through Internet research or eliminating class handout copying and distribution.

D. Identifying and Presenting Solutions

{48} Once a NAR has been prepared and reviewed with the faculty member for accuracy and completeness, the faculty liaison should work with the technical staff to identify ways in which certain functions or needs might be met. These solutions should be documented and then reviewed with the project leader. The faculty liaison will then meet again with the individual faculty member and present both the NAR and the suggested solutions for assisting the faculty member with the functions or needs identified in the NAR. It is always possible that some of the functions or needs identified may be met without the use or incorporation of technology. For example, a professor may be underutilizing support staff for administrative functions and may be presented with a solution that is procedural in nature, rather than technical. Since the objective in forming the project team is to integrate technology into the legal education process, however, it is highly likely that many of the solutions will be technological.

{49} The solutions presented may be general in nature as to the technology proposed to enhance the instructor's educational goals. For example, if one of the needs identified involves the distribution of course materials, the option presented for addressing this need could be the electronic posting of course materials on a web-based platform. The specifics as to what platform should be used will be discussed in the next process step, where the appropriate hardware and software are selected to implement the adopted options. These two steps should be separated so that the faculty member has the opportunity to accept, reject, or modify the solutions presented before resources are expended to evaluate the various technologies available to implement these solutions.

E. Selecting Appropriate Technologies

{50} Once the faculty member, project leader, and faculty liaison have agreed upon the solutions to be implemented, the project team must evaluate the hardware and software available to meet these needs. If the law school or university is committed to a particular hardware or software use, certain technology alternatives may be precluded. [169] The project team, however, should remain as flexible as possible in selecting technology so that the faculty member's needs are given the highest regard. It may be necessary to contact vendors, arrange for equipment or software demonstrations, or visit other schools where certain types of technology are used successfully. If faculty members have an interest in these demonstrations or visits, they should be given the opportunity to participate. In all likelihood, several professors will have the same needs

and the law school will select the appropriate technologies on a school-wide, rather than an individualized need or basis. The project team should discuss the system's advantages and disadvantages with the individual faculty members and select an appropriate technology. Although there may be a desire on the administration's part to provide a uniform solution such as TWEN to all faculty members, the project team should remain flexible and dedicated to serving individual faculty needs whenever feasible. A critical challenge with choosing technology solutions, however, is presented by the fact that technology is a moving target, and as we plan for certain new technology, the picture will change. This change occurs not only on a semester to semester basis, but sometimes even weekly, or from day to day.^[170]

F. Preparing the Implementation Plan and Managing the Project

{51} A project plan should be started before the needs assessment step begins. The plan should include a timeline for the needs assessment task, NAR preparations, solution identification, and technologies selection. The specific technology implementation, however, will be the most complex portion of the implementation plan and will require understanding the specific technologies selected.

{52} The implementation plan should identify each goal or solution that has been agreed upon. The individual tasks necessary to implement the identified solutions must be listed, assigned to the appropriate project team member(s), and given a beginning and end date. Examples of individual tasks to implement the solution of electronically distributing class materials using Virtual Classroom, would include the following responsibilities: contacting LEXIS; obtaining a password; arranging for training; and assisting the faculty member in loading documents to the Web. Because each professor is being treated as a separate project requiring an individualized NAR there will be an individual implementation for each faculty member who has agreed to implement a particular solution. Faculty liaisons must continue to work with the individual professors throughout the technological solutions implementation and be available for ongoing troubleshooting and support after the project has been completed.

{53} The project leader will be responsible for making sure that implementation plans are prepared and followed. Software packages are available to assist the project leader in the project management. Resources can be budgeted based on these plans and library services will demonstrate accountability for project support by using project management reporting.

G. Post-Implementation Evaluation and Continuing Maintenance

{54} A final step in the process, which is frequently ignored, is the "post mortem" phase. This post-implementation evaluation allows the institution to assess whether the project successfully met the institutional goals and the individual needs of the faculty in a cost-effective manner. Such information will be valuable to future project teams, which must deal with new technology and ongoing system maintenance requirements.

{55} Ongoing system maintenance tasks, such as troubleshooting and system updates, are not necessarily as exciting as beginning new projects. Nevertheless, law schools must realize and accept that when technology use is increased, technology support personnel must also be increased. A post-implementation evaluation allows management not only to assess the success (or failure) of the increased use of technology by the faculty and students, but also to assess the institutional value of continued resource devotion to future technology maintenance and enhancement.

IV. CONCLUSION

{56} Although there are many technological advances that can enhance legal education,^[171] there is a dearth

of legal educators who are both willing and able to use them. However, if we agree that it is the obligation of legal educators to prepare students for law practice in a modern society, then they must "continue to integrate sound educational practices and legal teaching expertise with modern electronic classroom material and global electronic communications tools." [172] Legal educators should not wait to be dragged onto the "information superhighway," [173] when they have the opportunity to plan for the wild ride of change and to enjoy the excitement. By using project management principles to integrate technology into legal education, educators will ensure that the technology chosen meet basic pedagogical goals. Professors will have more of an investment in the technology if they are involved in selecting technological solutions, and if the specific solutions supplied are designed to meet their individual needs.

{57} Using project teams and faculty liaisons will encourage legal educators to keep discovering ways in which technology can make them more effective. With technical guidance and help from fellow educators in library services or information systems, those who need to spend time with substantive law and scholarship will still be able to move ahead technologically and, thus, successfully prepare students to practice law in a modern society.

ENDNOTES[**]

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Shelley Ross Saxer, *One Professor's Approach to Increasing Technology Use in Legal Education*, 6 RICH. J.L. & TECH. 21 (Winter 1999-2000), at <http://www.richmond.edu/jolt/v6i4/article4.html>.

[1]. See Richard A. Matasar & Rosemary Shiels, *Electronic Law Students: Repercussions on Legal Education*, 29 VAL. U. L. REV. 909, 913 (1995) (noting "[t]he challenge for law schools is to find ways to optimize students' legal education by employing the appropriate technological tools" and emphasizing that "[l]aw school graduates must come to practice with the real-life tools that will help them compete with, or even eclipse, their more traditional colleagues."); see also Richard A. Danner, *Facing the Millennium: Law Schools, Law Librarians, and Information Technology*, 46 J. LEGAL EDUC. 43, 43 (1996) (stating that, "[t]he migration to the use of electronic information and technology in the United States legal system is a fait accompli," quoting Robert C. Berring).

[2]. 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) (instructing that "many faculty members remain somewhat wary of these technological changes"); 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) (expressing concern over whether the "relatively recent introduction of computers to law schools affect[s] the perceived or real decline in the profession").

[3]. See William R. Slomanson, *Electronic Lawyering and the Academy*, 48 J. LEGAL EDUC. 216, 216 (1998) (arguing that the use of technology in legal education may be the responsibility of all legal educators); Robert L. Nelson, *The Futures of American Lawyers: A Demographic Profile of a Changing Profession in a Changing Society*, 44 CASE W. RES. L. REV. 345, 383 (1994) (observing that the "legal curriculum could be substantively enriched by training in basic principles of management, accounting, and information technology").

[4]. "According to statistics from Jupiter Communications, there were approximately 8.6 million kids (5- to 12-year-olds) and 8.4 million teenagers (13- to 18-year-olds) online in 1998. By 2002, those cyberpopulations will increase to 21.9 million kids (a 155 percent increase) and 16.6 million teens (almost a 100 percent increase)." Jake Kirchner, *The Web's Hip-Hop Future*, PC Magazine, August 1, 1999, at 28 (noting that today's teenagers have grown up with the Web and that pressure from these students will push high schools and colleges to alter dramatically their curricula).

[5]. See Matasar & Shiels, *supra* note 2, at 910 (noting that grade schools, high schools, and colleges are using technology and that "[s]tudents brought up with this technology will need technology to learn" in a law school environment).

[6]. See Tracey Baetzel & Carl W. Herstein, *Virtual Memory: Looking Back at the Changing Relationship Among Lawyers, Law Firms and Technology*, 77 MICH. B. J. 422, 426 (1998) (stating "[m]any, if not most, law schools have not stepped up to the plate in terms of incorporating technology training into the law school curriculum"); see also Paul F. Teich, *How Effective is Computer-Assisted Instruction? An Evaluation for Legal Educators*, 41 J. LEGAL EDUC. 489, 489 (1991) (noting that, "[l]aw schools have been much slower than other professional and graduate schools to adopt computer-augmented teaching methods, perhaps because little evidence has ever been presented to law teachers that the necessary expense and effort can be justified by an improvement in student learning.>").

[7]. See David M. Becker, *My Two Cents on Changing Times*, 76 WASH. U. L.Q. 45, 54 & n.33 (1998) (expressing concern about the decline in research skills and the deficient research that results when total reliance is placed on computerized research).

[8]. See Matasar & Shiels, *supra* note 2, at 933 (concluding that "[p]roviding solid technical tools for law students furthers the goals of providing them the skills they need for legal practice."); see also Baetzel & Herstein, *supra* note 7, at 426 (stating "sending students into legal professions without practice in these [technology] areas is akin to sending medical students into surgery when all they have done is read the book").

[9]. See Baetzel & Herstein, *supra* note 7, at 422 (observing that "computers have steadily infiltrated the legal profession over the last 15 years, and have gradually changed not only the business of law, but its substantive practice as well"); see also Matasar & Shiels, *supra* note 2, at 910 (noting that "[c]omfort with change is now creeping into the legal profession"); Steven Keeva, *100 Law Firms Plug in: Both Large, Small Practices Catch up with Business in Embracing Technology*, 83 JUL. A.B.A. J. 100, 100 (1997) (according to recent technology surveys by the ABA and Chicago-Kent School of Law "lawyers are starting to close the technology gap with the business world").

[10]. See Baetzel & Herstein, *supra* note 7, at 425 (discussing how technology management has increased in importance in the operations of law firms and how technology has "significantly impacted law firms and

lawyers" over the last 15 years by increasing capital expenditures and requiring more spending to keep up with technology).

[11]. Cf. Jonathan Kalstrom, *The Paperless Chase*, 5 NEV. LAW., May 1997, at 13 (discussing the work of law professor Winton Woods of the University of Arizona College of Law in teaching students how to use hi-tech skills in a "courtroom of the future"). See generally Kristen L. Fulcher, Comment, *The Jury as Witness: Forensic Computer Animation Transports Jurors to the Scene of a Crime or Automobile Accident*, 22 U. DAYTON L. REV. 55 (1996) (discussing the use and admissibility of computer animations and simulations).

[12]. See Richard Warner et al., *Teaching Law with Computers*, 24 RUTGERS COMPUTER & TECH. L. J. 107 (1998) (providing an excellent article about the various technologies available to legal educators); see also *Bibliography: Thirtieth Selected Bibliography On Computers, Technology and the Law*, 24 RUTGERS COMPUTER & TECH. L. J. 453 (1998).

[13]. See Peter W. Martin, *The Internet: "Full and Unfettered Access" to Law-some Implications*, 26 N. KY. L. REV. 181, 209 (1999) (stating "[o]ne thing is certain: if lawyers are unable to change old patterns and fail to organize their skills and resources for effective application in a networked world, that very connectivity will marginalize their professional role.").

[14]. International legal databases have also been increasing in number and size as countries, such as Great Britain, Canada, and Australia, computerize their legal resources.

[15]. See Baetzel & Herstein, *supra* note 7, at 423 (noting that with the development of these online services, new lawyers, trained in law school "became increasingly comfortable with the new technology while their seniors generally took a more jaundiced view").

[16]. Geist, *supra* note 3, at 149; see also Matasar & Shiels, *supra* note 2, at 911 (noting that law students are sophisticated computer users with sophisticated electronic resources, such as LEXIS/NEXIS and WESTLAW, which are available at a reduced rate paid by their law schools and provide 24-hours-a-day access).

[17]. See Carol Ebbinghouse, *Library Standards: Evidence of Library Effectiveness and Accreditation*, Information Today, Inc., Sept. 1, 1999, at 20.

[18]. See Martin, *supra* note 14, at 196. See also *id.* at 202 (noting that digital law may bring the following direct and more speculative consequential benefits: more direct and more effective communication of law to those directly affected; greater potential for direct government/citizen interaction; more direct and more effective communication of essential data and options to official law implementers such as judges, police officers and environmental agency personnel; and more effective internal communication, providing greater transparency and more equitable, efficient law application).

[19]. See www.lexis.com/lawschool Home Page (visited Nov. 20, 1999) <<http://lawschool.lexis.com>> and *Welcome to lawschool.westlaw.com*, (visited Nov. 20, 1999) <<http://lawschool.westlaw.com>> for details about law school offerings by these services. See also Geist, *supra* note 3, at 163-74 (discussing various ways to use the Web in legal education).

[20]. Slomanson, *supra* note 4, at 222. Note that West previously charged \$20 per student to use TWEN, but no longer charges for a law school to use TWEN. See *id.* at 221 (noting that in 1997 West charged \$20 per student to use TWEN).

[21]. See *id.* at 221-22 (discussing TWEN and Virtual Classroom (WCB) as web posting services which require "little technical expertise beyond what it takes to send an e-mail message").

- [22]. See *Microsoft Office-Microsoft Office 2000 and HTML* (visited Nov. 20, 1999) <<http://microsoft.com/Office/enterprise/prodinfo/applhtml.htm>> (discussing how Office 2000 allows "users [to] [] save documents in HTML format and then open them to make edits using Office - without losing any important Office data . . .").
- [23]. See Geist, *supra* note 3, at 149-56 (discussing the early use of computerized legal education).
- [24]. See *id.* at 150-51 (describing the development of CALI).
- [25]. See *id.* at 151 (outlining international membership in CALI).
- [26]. See *id.* at 151-52 (noting the various international members in CALI).
- [27]. See generally Warner et al., *supra* note 13, at 111-12 (noting that there is a "small but growing literature evaluating the effectiveness of computer-assisted instruction ("CAI") in legal education . . ." but the "larger body of literature focusing on non-legal instruction also supports this conclusion").
- [28]. *Id.* at 112 (quoting Paul F. Teich, *How Effective Is Computer-Assisted Instruction? An Evaluation for Legal Educators*, 41 J. LEGAL EDUC., 489, 490 (1991)).
- [29]. See *id.* at 110-13 (discussing how CAI assists students in learning the black letter law by understanding the rationale behind the law); see also Geist, *supra* note 3, at 152 (noting that studies of CAI usage in law schools indicate that "with CAI, students learn material in about one-third less time than with conventional instruction").
- [30]. See Geist, *supra* note 3, at 152-53 (discussing the benefits of CAI).
- [31]. See Warner et al., *supra* note 13, at 112-13 (noting that students must actively construct analysis to respond to questions posed by a Socratic instructor in order to learn how to think their way through a legal issue, but also pointing out that computers can be helpful to enhance the quality of interactions between the professor and student in this regard).
- [32]. See Geist, *supra* note 3, at 156 (stating "the linear structure of most CAI exercises . . . may encourage students to simply regurgitate the author's view on a particular topic rather than enable them to develop their own thinking"). But see Warner et al., *supra* note 13, at 129-30 (recognizing the inherent danger in using tutorials-"that the tutorials may give students the sense that they understand more than they do" because students have acquired the ability to answer specific questions, but not the ability to apply legal rules and concepts to situations not present in the tutorial).
- [33]. See Geist, *supra* note 3, at 154 (observing that this problem was acute in the initial development of CAI, but that the development of software programs has made the process easier); see also Warner et al., *supra* note 13, at 130 (noting that tutorials can now be created without any knowledge of programming by using a program called CALI-IOLIS).
- [34]. See Geist, *supra* note 3, at 154-55 (noting that a 1980's report suggested that it may take 500 hours of work to create a one-hour CAI exercise).
- [35]. Cf. *id.* at 155 (noting students consistently criticize CAI exercises based on the lack of computer terminal availability).
- [36]. *Id.* at 144 (citations omitted).

[37]. See Slomanson, *supra* note 4, at 219 (discussing the first generation of law school computing).

[38]. Danner, *supra* note 2, at 45; see also *id.* (noting that word processing may encourage procrastination by allowing redrafting of articles in lieu of submission for publication, allow writers to "rework a few ideas into several publications," and contribute "to the proliferation of new law reviews and marginal contributions to the study of many topics").

[39]. See Matasar & Shiels, *supra* note 2, at 927-28 (discussing the use of notebook and laptop computers in class for student note-taking).

[40]. See Warner et al., *supra* note 13, at 139-40 (noting that students "may attempt to transcribe the class" until the teacher "stirred real discussion" of a topic).

[41]. *Id.* at 140.

[42]. See *id.* at 140-41 (noting that while keyboard noise is a concern, most students in one report did not find the sound distracting and that newer laptop models have virtually eliminated keyboard noise).

[43]. See *id.* at 120-21 (advocating the displaying of students' computer screens with a projector during class discussions as a teaching approach to make students think independently and present their results in public).

[44]. See *id.* at 141-42 (discussing the extra-curricular use of laptops in the classroom).

[45]. Warner et al., *supra* note 13, at 142 (citation omitted). For example, the University of Richmond School of Law in Richmond, Virginia requires all incoming first-year students to purchase a laptop computer package or to buy a comparable laptop meeting designated specifications.

[46]. See *id.* at 142-43.

[47]. See *id.* at 142 (discussing needed computer support).

[48]. See Charles D. Kelso & J. Clark Kelso, *How Computers Will Invade Law School Classrooms*, 35 J. LEGAL EDUC. 507, 512 (1985) (observing that law reviews in the 1980s were making extensive use of computers to prepare articles, rather than using the conventional process of typing, retyping, and then typesetting).

[49]. For instance, the *Richmond Journal of Law & Technology* ("*JOLT*") was the nation's first exclusively online law review, first published in April 1995.

[50]. See Geist, *supra* note 3, at 181 (noting the advantages of Web publishing).

[51]. See Matasar & Shiels, *supra* note 2, at 932 (discussing the level of Chicago-Kent College of Law support for computerized student exam-taking and expressing concern about the ability to accommodate all students due to the increasing demand for such technology).

[52]. For example, the Pepperdine School of Law uses an exam-taking program called ExamSoft that prevents access to the memory or hard drive during the exam. Effective October 15, 1999, ExamSoft will have new software available to increase the efficiency and accuracy of the exam-taking process, lessen the technical and administrative support required for the product, and provide additional exam-building and analysis capabilities to the faculty. See *ExamSoft* (visited Nov. 16, 1999) <<http://www.examsoft.com>> (discussing features of the ExamSoft software).

[53]. See Warner et al., *supra* note 13, at 166 (noting these obvious advantages).

[54]. As of Fall, 1999, ExamSoft is already being used in seven jurisdictions for bar examinations. See generally Kenneth R. Weiss, *Dreaded "Blue Books" May Go the Way of Quill Pens*, L.A. TIMES, at A1 (listing jurisdictions using ExamSoft software).

[55]. See Warner et al., *supra* note 13, at 167-68 (discussing disadvantages and equity concerns impacting the use of computers for exam-taking).

[56]. See *Professor Popovich's Home Page*, (visited Nov. 17, 1999)
<http://www.law.pepperdine.edu/Law_School/Faculty/popovich/index.htm>.

[57]. See Matasar & Shiels, *supra* note 2, at 920 (discussing the use of Folio VIEWS 3.0).

[58]. See Warner et al., *supra* note 13, at 137-38 (discussing these three basic software options for creating an electronic casebook).

[59]. See Matasar & Shiels, *supra* note 2, at 920-21 (discussing the uses of hypertext software).

[60]. See *id.* at 920 (noting how "electronic books are also designed to match print books . . .").

[61]. See *id.* at 924-25 (discussing the three options).

[62]. See *id.* at 928 (observing that some students disliked reading from a computer screen). It should be noted, however, that for some disabled students, reading books using the computer screen offers the advantage of making the size of the text much larger than it would be when it is printed. For some disabled students, holding the physical book may also be an impossibility. In Florida, a school district policy that resulted in the district's refusal to give special computer software for home use to a student with cerebral palsy was found to be in violation of federal disability law. The computer software, called the Kurzweil program, allows a student to read books without holding them, by placing them through a scanner so they can be read on a computer. See Lois K. Solomon, *School District Policy Violates Rights of Disabled*, Sun-Sentinel, Sept. 19, 1999, at 2B (discussing successful suit by advocacy agency to gain the Kurzweil program for a disabled student unable to hold a book).

[63]. Student discomfort with reading cases online can also be overcome by using software, such as Adobe Acrobat, to download and print material in its original format. See Geist, *supra* note 3, at 167 (noting that Adobe Acrobat may be used to "download and print material in its original font and format").

[64]. *Id.* at 158 (observing further that, "[a]lthough the Internet is currently only in the early stages of its development, it is already showing signs of overtaking CALR, CAI, and electronic casebooks by providing users with the capabilities of all three ventures in one user-friendly and powerful system."). See also Warner et al., *supra* note 13, at 153 (discussing the similarity of the Internet to electronic casebooks).

[65]. To find out more about the new West Group Custom Publishing Service, contact West at ccp@westgroup.com or visit the website *West Group's Custom Publishing Service* (visited Nov. 16, 1999) <<http://www.lawschool.westgroup.com>>.

[66]. To learn more, visit Smart Technologies Inc.'s Web site at *Smartech* (visited Nov. 16, 1999) <<http://www.smartech.com>> or *Welcome to the SMARTer Kids Foundation* (visited Nov. 16, 1999) <<http://www.smarterkids.org>>. See also *MicroTouch Digital Whiteboard Solutions* (last modified Dec. 30, 1999) <<http://www.microtouch.com/ibid/index.shtml>> (discussing features and price of the whiteboard).

[67]. See Warner et al., *supra* note 13, at 113-17 (discussing ways to use electronic presentations and how this technology "serves all three pedagogical goals: imparting a basic knowledge of black letter rules, developing an understanding of the underlying rationales behind the rules, and developing the ability independently to analyze legal issues") *id.* at 117.

[68]. The Logitech product, TrackMan *Live!* uses wireless radio technology that lets you advance through the presentation without pointing the mouse at the computer. It can be plugged into any Windows 95 computer without any software installation required. SurfMan is another Logitech remote mouse that is less expensive than the TrackMan Live mouse and may satisfy your needs. If you are interested in either of these products, they are available at CNET - Shopping - Latest Prices - TRACKMAN LIVE! CORDLESS FOR PC (visited Nov. 16, 1999) <<http://www.shopper.com>>.

[69]. For example, Professor Norm Garland, a professor at Southwestern School of Law, uses electronic slide shows to teach Evidence and Criminal Procedure. See SW LAW Faculty Profiles (visited Nov. 16, 1999) <<http://www.swlaw.edu/a/02-03-garland.shtml>>.

[70]. See Warner et al., *supra* note 13, at 121-22 (discussing the effects of this technology on the classroom).

[71]. See *id.* at 122-24 (discussing technical considerations for using presentation software and video projection systems).

[72]. As an avid user of presentation software in the classroom, the author has been particularly frustrated in attempts to integrate video clips into presentations. The technology exists, but time constraints have prevented this author from investigating the alternatives, gathering the source material, and actually implementing the technology.

[73]. See Geist, *supra* note 3, at 180 (discussing the use of audio and video to enrich the learning experience and the suitability of the Internet for digitized video).

[74]. For example, the Digital Practice software, Visionary, is a multi-media discovery and trial litigation support package that includes a database, an image view, a deposition manger with video syncing capability, a case outliner, and a trial presentation module. See *Digital Practice, Discovery & Trial for the Next Millennium* (visited Nov. 21, 1999) <<http://digitalpractice.com>>.

[75]. See generally Fulcher, *supra* note 12, at 57 (arguing that current admissibility standards for this type of evidence should be relaxed).

[76]. See *id.* at 71-72.

[77]. *Id.* at 72 (quoting I. Neel Chatterjee, *Admitting Computer Animations: More Caution and New Approach Are Needed*, 62 DEF. COUNS. J. 36, 43 (1995)).

[78]. See Baetzel & Herstein, *supra* note 7, at 425 (noting that "TV Generation" juries have created the need for lawyers to present and prove a case using animation and projection techniques).

[79]. See Kalstrom, *supra* note 12, at 13 (discussing how computer literacy increases a student's chances of success in the legal job market).

[80]. See *id.* (reporting on courtroom technology courses available in some law schools such as University of Arizona and McGeorge School of Law). See also *Shelldrake Developer The Multimedia Prototyper* (visited Dec. 30, 1999) <<http://shelldrake.com>> (describing multimedia software used to build an interactive trial for teaching litigation techniques).

[81]. See Thomas, *supra* note 3, at 236-37 (describing the development of e-mail).

[82]. See Danner, *supra* note 2, at 48-49 (discussing the Duke Law School reliance on the e-mail system and the Internet).

[83]. Matasar & Shiels, *supra* note 1, at 929.

[84]. See Thomas, *supra* note 2, at 240 (describing e-mail as the new water cooler).

[85]. See *id.* at 240-41 (discussing the function of e-mail in the educational environment).

[86]. See Dirt@listserv.umkc.edu; lawprof@chicagokent.kentlaw.edu

[87]. See Slomanson, *supra* note 3, at 221 (discussing how a class discussion list "can advance pedagogical objectives before, during, and after class" and suggesting that the TWEN and WCB products from WESTLAW and LEXIS can be used to easily establish and monitor these lists).

[88]. Warner et al., *supra* note 13, at 107.

[89]. See *id.* at 143-44 (discussing ways computers extend educational instruction beyond the classroom).

[90]. See Geist, *supra* note 3, at 169-70 (describing course discussion groups as "virtual classrooms").

[91]. Warner et al., *supra* note 13, at 144.

[92]. See *id.* at 150 (describing the benefits of the anonymity of e-mail for shy students).

[93]. But see *id.* at 145-46 (explaining that encouraging students to use e-mail for questions and comments may actually result in more student office visits by those students who "find the courage to visit you in person once they have broken the ice via e-mail"). *Id.* at 146.

[94]. See Becker, *supra* note 8, at 68 (highlighting that computers and the Internet may eliminate human contact and that "student questions often reflect nothing more than a desire for human contact and feedback").

[95]. Thomas, *supra* note 3, at 233. See also *id.* at 233 & 244 (opining that this "disease [of alienation] is all too often contracted in law school" and that the "depersonalizing aspects of e-mail must not be allowed to (further) isolate law students from the idea that law is of and for people").

[96]. "A lawyer may transmit information relating to the representation of a client by unencrypted e-mail sent over the Internet without violating the Model Rules of Professional Conduct (1998) because the mode of transmission affords a reasonable expectation of privacy from a technological and legal standpoint." See ABA Comm. on Ethics and Professional Responsibility, Formal Op. 99-413 (1999) *available at Headnote Summaries of Recent ABA Ethics Opinions* (visited Nov. 21, 1999) <<http://www.abanet.org/cpr/ethicopinions.html>>.

[97]. See Warner et al., *supra* note 13, at 160-62 (discussing the issue of information overload and the results of a 1997 survey, which indicated that a clear majority of the students surveyed found the online discussion helpful, but also a course requirement that created a significant demand on their time).

[98]. If you are interested in this product, you can find out more about it by contacting their website at *Enfish Tracker Pro* (visited Nov. 21, 1999) <<http://www.enfish.com>>.

[99]. See Geist, *supra* note 3, at 142 n.2 (explaining briefly the Internet and its integral applications such as the Web and electronic mail).

[100]. See *id.* at 142-43 (noting that "[s]ince the advent of the first [w]eb browser in 1993, numerous faculty and students worldwide have embrace the plethora of possibilities presented by networked classes, chat groups, and WWW homepages").

[101]. See *id.* at 144 (describing "the circumstances that have elevated the role of the Internet in most other academic disciplines are now poised to drag legal education onto the proverbial 'information highway' "); see also Keeva, *supra* note 10, at 100 (citing Chuck Coulter, chair of the ABA's Coordinating Commission on Legal Technology, who observed that law firms have quickly embraced the Internet and that, for the first time, the legal profession has "adopt[ed] new technology just as quickly as the business world").

[102]. Geist, *supra* note 3, at 141.

[103]. *Id.* at 158.

[104]. See Stephen Johnson, *Environmental Law Virtual Guest Speakers* (visited Nov. 19, 1999) <<http://merlin.law.mercer.edu/elaw/speaker.htm>>. See generally, ELTC, *The Environmental Law Teachers' Clearinghouse* (visited Nov. 19, 1999) <<http://merlin.law.mercer.edu/elaw/elawres.htm>> (demonstrating the different types of resources available to environmental law teachers online).

[105]. See Lexis Publishing, *Web Lectures: WebBuzz* (visited Nov. 19, 1999) <<http://lawschool.lexis.com/weblec/webbuzz/index.html>>.

[106]. See Geist, *supra* note 3, at 159 (listing several shortcomings of using the Web as a legal education tool).

[107]. See *id.* at 159-60 (discussing the need to develop a web culture).

[108]. See generally *id.* at 161-63 (discussing the problems of time constraints and technology limitations).

[109]. *Id.* at 161.

[110]. *Id.* at 163.

[111]. See Wendy R. Leibowitz, *Alumni Offices Use Electronic Media to Forge Closer Ties With Graduates* (last modified Oct. 15, 1999) <<http://chronicle.com/free/v46/i08/08a04501.htm>> (discussing use of web resources by Alumni Offices to form closer relationships with alumni).

[112]. See Geist, *supra* note 3, at 159 (noting various law course websites).

[113]. See Slomanson, *supra* note 4, at 218-19 (discussing sources for determining what others are doing to integrate computers into law school teaching and citing Jurist website at *JURIST: The Law Professors' Network* (visited Nov. 19, 1999) <<http://jurist.law.pitt.edu/index.htm>>). See also MAALL, *Class Use of the Internet in Law Schools* (visited Nov. 19, 1999) <<http://www.siu.edu/offices/lawlib/MAALL/classuse.htm>> (including a survey taken by law professors to discover how they use the Internet in their classes, and examples of instructional uses of the Internet in the law school environment).

[114]. See Geist, *supra* note 3, at 164 (noting that while "some of the suggestions and examples are not difficult to implement, in many instances they require a fundamental rethinking about long established legal teaching methodology").

[115]. See Thomas, *supra* note 3, at 234 (describing a scenario involving distance learning).

[116]. Warner et al., *supra* note 13, at 164.

[117]. See *id.* at 165 (noting that one professor could teach in ten different schools).

[118]. See Steven Keeva, *Stars of the Classroom: Will Top Profs Who Instruct Via Internet Dominate Teaching?*, 83 A.B.A. J. 18 (1997) (quoting Professor Peter Martin of Chicago-Kent College of Law as saying "Every law school has something the faculty wants to teach but can't because there isn't the critical mass of students to justify offering the class. Then there are those students who want to take something but have no one at the school to teach it."). *Id.*

[119]. Helen Leskovac, *Distance Learning In Legal Education: Implications Of Frame Relay Videoconferencing*, 8 ALB. L.J. SCI. & TECH. 305, 309-10 (1998) (discussing the benefits of distance learning).

[120]. See Warner et al., *supra* note 12, at 165 (noting that distance learning gives students contact with students outside their school).

[121]. *Id.*

[122]. See *id.* at 164-65 (noting that a good teacher is a "model of intellectual and professional virtues such as responsibility, thoroughness, and tolerance" and that "[t]hese virtues are most effectively on display when teacher and student are present in the same classroom"); see also Leskovac, *supra* note 120, at 310-11 (noting that legal education "employs a pedagogy highly dependent on personal encounters between the student, the instructor, and the other students," both inside and outside the classroom).

[123]. See Thomas, *supra* note 3, at 244 (describing how technology "breeds isolation").

[124]. See Mark Thompson, *Roll Over, Socrates, PaperChase.com Is Online*, CONN. L. TRIB., Aug. 16, 1999.

[125]. See Leskovac, *supra* note 120, at 308. The development of distance learning in legal education had previously been constrained by the ABA standard prohibiting correspondence study. See *id.*

[126]. Ginsburg: *Internet Should Bring Us Together, Not Foster Isolation*, 157 N.J. L.J. 1058 (1999).

[127]. *Id.*

[128]. See Geist, *supra* note 3, at 177-79 (discussing examples of law professors using long-distance legal education on an experimental basis).

[129]. See generally Ronald W. Staudt, *The Future of the Legal Profession: Does the Grandmother Come With It?*, 44 CASE W. RES. L. REV. 499 (1994) (discussing the role of human interaction in law teaching and law practice).

[130]. See *id.* at 517 (noting that artificial intelligence will not replace "the work of lawyers who do sophisticated legal analysis and argument").

[131]. *Id.*

[132]. J.C. Smith, *The Charles Green Lecture: Machine Intelligence and Legal Reasoning*, 73 CHI.-KENT.

[133]. *Id.* at 346-47, citing HAL'S LEGACY: 2001'S COMPUTER AS DREAM AND REALITY (D.G. Stork ed., 1997).

[134]. Staudt, *supra* note 130, at 517.

[135]. *See id.* at 515-16 (noting that some of the predictions have come true concerning the use of computers to produce document sets in "divorce, workman's compensation, personal injury, estate planning, tax, residential real estate, collections, and other repetitive practices"). *See also Lawgic Home* (visited Dec. 30, 1999) <http://www.lawgic.com>.

[136]. *See* Mark Thompson, *Smart, Yes, But Does It Bill Hours?*, *The Recorder*, Oct. 20, 1999, at 1 (noting that lawyers may keep this technology secret from their clients because of time-billing system concerns).

[137]. *See* Staudt, *supra* note 130, at 517 (noting the launch of WESTLAW's WIN searching system).

[138]. *See* Andrew Bolger, *Online Data May Cut Wait for Injury Settlement*, *Financial times* (London), Oct. 22, 1999, at 4.

[139]. For more information about this company, see *Cybersettle.com - Changing the Way the World Settles Disputes* (visited Dec. 30, 1999) <http://www.cybersettle.com>.

[140]. *Corel Partners With Expert Ease Software to Bundle DEAL PROOF with WordPerfect Law Office 2000*, M2 Presswire, Aug. 5, 1999. *See also Corel: Home Business, Graphics, Web and Desktop Publishing Solutions* (visited Dec. 30, 1999) <http://corel.com>.

[141]. *See* Thomas, *supra* note 3, at 246 (noting that until speech recognition technology is improved, lawyers are at a disadvantage if they do not have the ability to interact with a computer directly because familiarity with a dictaphone will not be sufficient).

[142]. *See, e.g.,* the Sony digital recorder at *Sony IC Recorder - Home Page* (visited Dec. 30, 1999) <http://www.sony.com/icrecorder> or the Olympus digital voice recorder at *Olympus Homepage* (visited Dec. 30, 1999) <http://www.olympus.com>.

[143]. For a discussion of technology use to assist disabled students in public education, see generally Sean J. Smith & Eric D. Jones, *Special Education: The Obligation to Provide Assistive Technology: Enhancing General Curriculum Access*, 28 J. L. & EDUC. 247 (1999).

[144]. Litigation support products currently exist to allow quick access to video deposition testimony, but only when there is a deposition transcript with a synchronized digital video. *See, e.g., Digital Practice, Discovery and Trial for the Next Millennium!* (visited Dec. 30, 1999) www.digitalpractice.com (the Visionary product allows deposition management with synchronized video).

[145]. Thomas, *supra* note 3, at 235. Legal educators need to ask "whether the computer is anything more than 'an instructional gimmick,' or what the implications of technology may be for the profession." *Id.*

[146]. *See* Slomanson, *supra* note 4, at 216 (stating that professors contend that law schools have been slow to use "computer-augmented teaching methods, perhaps because little evidence has ever been presented to law teachers that the necessary expense and effort can be justified by an improvement in student learning").

[147]. *See* Matasar & Shiels, *supra* note 2, at 917 (noting that the authors assume traditional means of

instruction will remain in force).

[148]. Thomas, *supra* note 3, at 245 (quoting Terrance Sandalow, *The Moral Responsibility of Law Schools*, 34 J. LEGAL EDUC. 163, 170 (1984)).

[149]. Matasar & Shiels, *supra* note 2, at 917.

[150]. *Id.* at 918 (describing the learning process from the student's framework).

[151]. Warner et al., *supra* note 13, at 110-11 (discussing "the basic goals" of legal education and how computers can help achieve these goals).

[152]. Kelso & Kelso, *supra* note 49, at 507.

[153]. *See id.* at 507 (noting that the article explores "the effect computers will have on student education outside the classroom").

[154]. *See* Thomas, *supra* note 3, at 244 (stating that professors impart morals and values in addition to teaching analytical skills).

[155]. *See* Slomanson, *supra* note 4, at 218 n.10 (suggesting that the "teacher and the institution must base the desire to integrate teaching and technology on something more than the glitz factor of being in the technological vanguard"). *Id.*

[156]. Although students should be involved in this process as well, because of their transient status, it is best to start with faculty and administration first. However, the same approach could be used to integrate technology into the student side of the learning equation.

[157]. *See* Jeffrey R. Young, *U. of Washington Tries a Soft Sell to Woo Professors to Technology*, The Chronicle of Higher Education, May 28, 1999, at A23 (discussing using those professors who always want to be on the leading edge of technology as a standard strategy for encouraging the spread of technology by example).

[158]. *See* Stan Kolodziej, *Changes That Are More than CPU-deep*, Computerworld, June 26, 1989, at 71, for a description of ways in which information systems organizations have improved efficiency in companies, including Chrysler Financial, where a team of eight key people from business operations and information systems collaborated to learn "more about each other's operations by defining joint requirements and coming up with solutions together." The process enabled MIS to get closer to what users needed, and users learned "how to better take advantage of MIS resources." *Id.*

[159]. The University of Washington uses a technology-training group called "Uwired" to offer its faculty members its services in a program centered on "helping professors become comfortable with technology and fit it into their teaching styles." Young, *supra* note 158, at A23. *See Catalyst* (visited Nov. 22, 1999) <<http://depts.washington.edu/catalyst/home.html>> for a set of tools and guides developed by "Uwired" to give professors a starting point for launching into cyberspace.

[160]. *See* Slomanson, *supra* note 4, at 220 (noting that, "one does not have to be a computer guru to incorporate the World Wide Web into legal education," but to enrich a course with technology will require an investment of research and development time).

[161]. *See* Geist, *supra* note 3, at 154 (citing the fact that legal educators were not trained in computers as "[p]erhaps the single biggest barrier to CAI's acceptance in legal education...").

[162]. Some examples of these changes include: Dick Danner, Senior Associate Dean for Library and Computing, and Research Professor of Law, Duke School of Law; Richard Leiter, Associate Dean of ITS (Information Technology and Services) and Professor of Law, Howard School of Law; Myra Kathleen Saunders, Law Librarian, Associate Dean & Assistant Professor, U.C.L.A. School of Law; Pauline M. Aranas, Assistant Dean for Library and Information Technology, Associate Professor of Law, Vanderbilt School of Law; Robin Mills, Associate Dean for Library & Information Technology, Emory School of Law.

[163]. The term "faculty liaison" is already being used in a number of law schools, but it is accompanied by a different job description and purpose. However, these existing positions could be restructured to include technology integration duties, as long as the institution realizes that it needs to establish more positions to meet the need generated by this type of integration project. An alternative is to use a name such as "faculty facilitator" and fill these positions appropriately. Because the term "liaison" has been used in computer system implementations for many years to indicate user involvement in the process of automation, the author will use the description "faculty liaison" for purposes of this article.

[164]. See Odvard Egil Dyrli & Daniel E. Kinnaman, *Districtwide Technology Planning: the Key to Long-term Success*, Tech. & Learning, April 1, 1994, at 50 (discussing the makeup of a Districtwide Education Technology Steering Committee for school systems and stressing the importance of teacher participation throughout every phase of the committee's work). This article is the fourth in a series that includes related articles on developing technology surveys, a source for sample technology plans, and common technology plan pitfalls. See *id.*

[165]. See Robert K. Carr, *Creating Consistency in a World of Differences*, Government Computer News, Oct. 2, 1989, at 58 (stating "[w]e are still staffing an office whose function will be to maintain liaison with users, and ascertain their needs and make sure the development and implementation of information systems are responsive to those needs rather than technology-driven, as they often are in classic shops"). *Id.* See also Young, *supra* note 158, at A23 (noting that the technology-training group avoids hiring computer-science majors as consultants and looks instead for "non-technical people who are comfortable with technology" and who are "friendly, easy-going, socially skilled people"). *Id.*

[166]. See Dyrli & Kinnaman, *supra* note 165, at 50. This article describes a similar approach to implementing technology in an educational environment, which includes the following steps: (1) conduct a self-study to prepare a summary list of educational goals to serve as a foundation for making decisions about the use of technology; (2) assess present use of technology by using survey instruments, interviewing teachers and students, and making classroom observations; (3) develop a guiding framework to map out the way in which technology will be used to reach the educational goals. This step should include gathering information about available technologies, attending technology demonstrations, workshops, professional conferences, and visits to schools with strong programs; (4) implement the plans; and (5) decide how to evaluate progress with ongoing feedback.

[167]. Linda King et al., *University Information Processes: Architects for the Virtual University*, at 4 (unpublished manuscript presented at CUMREC '98, The College and University Computer Users Association Conference, on file with the authors who are Process Analysts in the Information Technology Division of University Information Processes of the University of Michigan, at Ann Arbor, Michigan) (describing Step 2 of the Process Innovation Methodology used by process analysts in University Information Processes which involves understanding current processes and documenting them).

[168]. Slomanson, *supra* note 4, at 223 (suggesting that primary pedagogical objectives be identified before bringing technology into the course).

[169]. For example, if the institution does not support Apple systems, certain alternatives may not be

economically or practically feasible.

[170]. For example, a law school might choose to use TWEN over LEXIS, primarily because TWEN has linking to statutes, regulations and cases, and LEXIS does not. However, once LEXIS establishes the linking, the library is faced with another decision as to whether a reduced cost offered by LEXIS justifies retraining people to use a new, perhaps better, product.

[171]. *See* Slomanson, *supra* note 4, at 228 (describing the advantages of incorporating technology into courses taught in law school).

[172]. Matasar & Shiels, *supra* note 2, at 933.

[173]. *See* Geist, *supra* note 3, at 144 (noting that the circumstances are ripe to "drag legal education onto the proverbial 'information superhighway'").

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