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Technocentrism and the Soul of the Common Law Lawyer

Keywords

Technology, printing revolution, legal profession, legal education

ESSAY

TECHNOCENTRISM AND THE SOUL OF
THE COMMON LAW LAWYER

MOLLY WARNER LIEN*

The very best, the very worst, the most beautiful and the most ugly
illusions about the future for which people sacrificed their lives
were probably to be found in the same place and, what was even
more frightening, were probably the same thing.¹

The Temple of Dawn

INTRODUCTION

In recent years, technology has changed both the study and practice of law. The law has its own culture, comprising a shared language, common ethical norms, models of reasoning, and tools of trade. As with any culture, changes in the tools used in legal practice inevitably influence the profession's development, creativity, and responsiveness.² Although technology enhances the study and practice of law, its use also subtly changes the way lawyers reason and think.³ This Essay suggests that these changes may be harmful to the

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1. YUKIO MISHIMA, *THE TEMPLE OF DAWN* 88 (E. Dale Saunders & Cecilia Segawa Seigle trans., Knopf 1973).

2. See, e.g., Lawrence M. Friedman, *Law, Lawyers, and Popular Culture*, 98 *YALE L.J.* 1579, 1583-84 (1989) (discussing the telephone as an example of how technology has affected the practice of law).

3. See Barbara Bintliff, *From Creativity to Computerese: Thinking Like a Lawyer in the Computer Age*, 88 *L. LIBR. J.* 338, 345 (1996) (discussing how computer research emphasizes facts rather

process of legal reasoning, and that lawyers will use technology more wisely only if they are aware of its negative impacts.

Previous technological revolutions have had similar effects. For example, the invention of the printing press made books widely available, expanded literacy, and facilitated shared intellectual social discourse.⁴ Unfortunately, the printing revolution also eroded the oral tradition and, to some extent, may have weakened the bonds between generations.⁵ Likewise, the invention of television and its subsequent elevation over print journalism has changed popular levels of understanding.⁶ Although television in Western societies informs a broader audience than the written word, it has relegated virtually all public discussion to “sound bites” and impoverished the quality and depth of our shared discourse.⁷ Given the undisputed

than legal concepts or rules).

4. See ELIZABETH EISENSTEIN, *THE PRINTING PRESS AS AN AGENT OF CHANGE: COMMUNICATIONS AND CULTURAL TRANSFORMATIONS IN EARLY-MODERN EUROPE* 27-29, 36 (1979) (crediting the printing press for rapidly expanding literacy among lay people and catalyzing the industrial revolution).

5. See JAMES JOSEPH O'DONNELL, *AVATARS OF THE WORD: FROM PAPYRUS TO CYBERSPACE* (1998). Some observers argue that the change in learning from oral storytelling to printed materials altered not only the means, but also the manner and content of communication. See JAY DAVID BOLTER, *WRITING SPACE: THE COMPUTER, HYPERTEXT, AND THE HISTORY OF WRITING* 7 (1991) (noting that print must appeal to a particular audience because it cannot be modified for various audiences); see also M.E. Katsh, *Communication Revolutions and Legal Revolutions: The New Media and the Future of Law*, 8 *NOVA L. REV.* 631, 639-40 (1984) (describing oral communication as very localized and therefore focused on the local community, while the printed word is easily transportable over great distances and therefore caters to broader interests); cf. MARSHALL McLUHAN, *UNDERSTANDING MEDIA: THE EXTENSIONS OF MAN* 172 (1964) (arguing that the printed word and its tendency to fix points of view and to support group thinking contributed to “nationalism, industrialism, mass markets, and universal literacy and education”); CARL SAGAN, *BILLIONS AND BILLIONS: THOUGHTS ON LIFE AND DEATH AT THE BRINK OF THE MILLENNIUM* 35 (1997) (“The reversal of this trend [of isolationism]—the movement toward the reacquaintance and reunification of the lost tribes of the human family, the binding up of the species—has occurred only fairly recently and only because of advances in technology.”).

6. Cf. M. ETHAN KATSH, *LAW IN A DIGITAL WORLD* 102 (1995) (stating that television has provided a more effective medium for reaching large audiences).

7. See RONALD A. CASS, *REVOLUTION IN THE WASTELAND: VALUE AND DIVERSITY IN TELEVISION* 19 (1981) (noting that news stories are often selected based upon what the public wishes to see, rather than what it ought to know); JAMES FALLOWS, *BREAKING THE NEWS: HOW THE MEDIA UNDERMINE AMERICAN DEMOCRACY* 6-7 (1996) (arguing that the rise of “star journalism” has compromised journalistic choices about providing valuable information to the public); Raymond Snoddy, *Media Culture “Trivializes Serious Debate”*, *FIN. TIMES*, July 7, 1997, at 8 (noting a recent study at the London School of Economics suggesting that the emphasis on superficiality in media culture represents an “evisceration of moral understanding”); cf. Theodore Peterson, *Why the Mass Media Are That Way*, in *MASS MEDIA AND COMMUNICATION* 56, 70 (Charles S. Steinberg ed. 1972) (“[A]re we right in the notion that although the media have a responsibility to enlighten the public, the public has no special responsibility to be enlightened?”).

The prevalence of television as a mass medium has also altered our perception of truth. As the author of one essay observed:

Television appears to the viewer to be a description of reality; moreover, reality is perceived to be on television. These two propositions—television is about reality, and

benefits of expanded information and knowledge, few would suggest that knowledge of the adverse consequences of these technologies would have deterred their use.⁸ Nevertheless, early awareness of the side effects might have minimized some of the disadvantages of the new technologies.⁹ Therefore, we ought to be aware of similar concerns about the impact of technology on the nature, characteristics, and originality of legal analysis.¹⁰

It is not my intent to criticize all uses of technology in the legal profession or education. To the contrary, I recognize that technology has broadened our information base to seemingly limitless proportions. Word processing and communication technologies have expanded our work potential and accelerated the exchange of ideas across both the classroom and the globe.¹¹ That said, and at the risk of being consigned to the ranks of neo-Luddites,¹² I fear that some uses of computer technology may have a negative

reality is on television—are different but complementary ideas. There appears to be a one-to-one relationship between visual images and reality (actual or imagined) [T]he visual image is related to the order of reality. Sight is the sense we most trust.

Richard Stivers, *Technology, Discourse, and Truth*, 64 U. CINN. L. REV. 1259, 1266-67 (1996).

8. See, e.g., KATSH, *supra* note 6, at 88, 237-43 (assuming that easier and expanded access to information is beneficial to society and that a new technological environment will lead to a “revolution of perception”).

9. Cf. Stivers, *supra* note 7, at 1260-61 (discussing the danger that technology may pose by depersonalizing human relationships and suppressing individuality). But cf. Jessica T. Matthews, *Power Shift*, 76 FOREIGN AFF. 50-51 (1997) (noting that the political and societal ramifications of the computer and telecommunications technologies have not been considered)

10. I raise this issue because in recent years lawyers have embraced the use of technology in their practices. See Rosemary Shiels, *Technology Update: Attorneys’ Use of Computers in the Nation’s 500 Largest Law Firms*, 46 AM. U. L. REV. 537, 542 (1996) (providing the results of yearly surveys taken from 1986 to 1995 demonstrating the prevalence of work stations and local area networks, as well as the use of online research services). Each year, the American Bar Association hosts an annual TechShow. Even with a substantial registration fee of \$795 per person in 1998, it drew over 1,000 attendees. Telephone Interview with Rosemary Shiels, Director of the Section on Law Practice Management, American Bar Association (Mar. 8, 1999).

11. One observer commented that technology has even transformed political networks:

The most powerful engine of change in the relative decline of states and the rise of nonstate actors is the computer and telecommunications revolution, whose deep political and social consequences have been almost completely ignored. Widely accessible and affordable technology has broken governments’ monopoly on the collection and management of large amounts of information and deprived governments of the deference they enjoyed because of it. In every sphere of activity, instantaneous access to information and the ability to put it to use multiplied the number of players who matter

Matthews, *supra* note 9, at 51.

12. Neo-Luddites believe that technology has a negative impact on society. The original Luddites were people in early nineteenth-century England who reacted to the Industrial Revolution by destroying looms, burning factories and breaking machinery. See Reed Karaim, *Technology and its Discontents*, CIVILIZATION, May/June 1995, at 50; see also Andrew Jackson Heimert, *Uncommon Property*, 105 YALE L.J. 2297, 2300 n.17 (1996) (reviewing THEODORE STEINBERG, SLIDE MOUNTAIN, OR, THE FOLLY OF OWNING NATURE (1995)) (comparing the traditional notion of the Luddite with the views of the author).

impact on the soul of the law. Insensate use of computers, both in legal education and practice, is altering the way we think about and use the law.¹³

I base my concerns about the emphasis on using technology in legal practice and education on a number of factors. First, to date, no empirical study exists which explores whether the presentation of information in an electronic format supports the learning and problem solving processes in cases of complex texts such as case decisions and statutes.¹⁴ Because cases are rarely simple, they are best read using a methodology that encourages deep reading and mastery, rather than the process of rapid rule extraction that often accompanies texts located through the use of isolated word searches. Given these basic assumptions, it is troubling, if not astounding, that few scholars have evaluated how the technology affects the nature and quality of legal reading and legal analysis.¹⁵

Second, just as television created “sound bite” journalism and discourse, technology seems to generate “law-byte” reasoning and hypertext¹⁶ analysis.¹⁷ Lawyers and law students increasingly focus on

13. The inquiry is a timely one because many law schools including Chicago-Kent, Detroit College of Law, Duke, Florida, Hamline, Illinois, Indiana-Bloomington, Northwestern, Nova Southeastern, Oregon, Regent, Richmond, Stetson, Villanova, and Wisconsin require either all students, or students in designated sections, to buy computers, and in some cases even require students to equip their computers with infobase technology. See James E. Duggan, *Mandating Computer Ownership at Law Schools: A Survey* (last modified Feb. 13, 1998) <<http://www.siu.edu/offices/lawlib/survey.htm>>.

14. More broadly, there is no empirical evidence that demonstrates that computer learning in general is more effective than learning through traditional methods. See Karaim, *supra* note 12, at 48 (summarizing comments by Theodore Roszak, Professor of History at California State University). Nearly all the literature on the subject of technology focuses on *how* to use more of it, rather than *whether or when* it should be used. See, e.g., RUSSELL W. BURRIS, *COMPUTER NETWORK EXPERIMENTS IN TEACHING LAW* 51-62 (1980) (reporting that a series of experiments demonstrated the benefits of computer-based exercises for teaching the law); Peter B. Maggs & Thomas D. Morgan, *Computer-Based Legal Education at the University of Illinois: A Report of Two Years' Experience*, 27 J. LEGAL EDUC. 138, 141-51, 154-56 (1975) (describing the experiences using the PLATO method of computer-assisted instruction and noting that some limitations may be corrected with advanced technology). See generally Paul F. Teich, *How Effective is Computer-Assisted Instruction? An Evaluation for Legal Educators*, 41 J. LEGAL EDUC. 489, 497-501 (1991) (surveying journal articles and dissertations which reviewed empirical studies on the effectiveness of computer-aided instruction as a legal teaching technique).

15. When he wrote about undergraduate education, Mark Shields was disturbed by the lack of critical evaluation of the effectiveness of computers in the classroom. See Mark A. Shields, *Academe Enters Age of Anticippointment*, 4 TECHNOS 30 (1995) (expressing concern that the strong emphasis on technological success simply reflects the societal bias that new technology necessarily represents progress), reprinted in Mark A. Shields, *Academe and the Technology Totem*, EDUC. DIG., Feb. 1996, at 43, 47. As a result, he labeled the phenomenon “techno-utopianism.” See *id.* at 43.

16. Hypertext is a computer technology which permits one to move from any spot in a text to any subject of one’s choosing simply by pressing a key. See KATSH, *supra* note 6, at 18.

17. See Bintliff, *supra* note 3, at 340 (asserting that “meaning doesn’t come from data alone” and context and interrelationships are equally important).

accessing, managing, and linking information,¹⁸ and devote less time and energy to careful analysis or critical evaluation of legal rules.¹⁹ While technology unquestionably gives lawyers the ability to marshal bits of information instantly from a host of cases, and to dispatch them into memoranda and briefs like well-drilled soldiers in a war of logic, the speed of deployment inevitably discourages lawyers from taking the time to analyze the wisdom, correctness and applicability of legal arguments. Lawyers and law students using “law-bytes” inevitably pay less attention to the reasoning, theory and policy that drive a decision, and give less consideration to the justness of the result.²⁰ Concomitantly, the methodology of researching in and working with electronic texts encourages work habits that prioritize speed and all too easily enable lawyers to find a kernel of phraseology that may support their often incorrect preconceived notions.²¹

Third, both basic learning theory and the observation of teachers and law firm partners suggest that technocentric pedagogy can be a disadvantage to certain individual learning styles.²² We should not assume that legal learning and analysis will improve with greater use of technology.²³ Too many conferences and faculty meetings start with the agenda item, “How can we use more technology in our classroom or practice?” which assumes the superiority of “law-byte” methodology. The question should be, “How can we improve our teaching or lawyering?”, Lawyers should use technology only when it

18. *See id.* at 349 (observing that lawyers are typically satisfied once a computer search yields a short citation list).

19. *See id.* at 345 (arguing that lawyers using technology overemphasize parallel facts rather than legal theories when building precedential support); *cf.* Karaim, *supra* note 12, at 48 (quoting Professor Roszak, who stated that “the mind thinks with ideas, not with information”).

20. *See* Bintliff, *supra* note 3, at 350 n.5. (arguing that the emphasis on matching facts encourages the disregard of legal rules).

21. *See id.* at 348 (observing that reliance on computer search terms limits a legal researcher’s ability to see the broad picture).

The recent change in practice among the federal courts to accept brief filings in hypertext may affect judicial review as well. *See* Francis X. Gindhart & Carl R. Moy, *High-Tech Appeals: Can Hypertext Briefs Aid Justice Without Changing the System?*, A.B.A. J., July 1997, at 78, 78-79 (debating whether the inclusion of video clips of testimony will alter the standard of review and result in appellate courts giving less deference to the trier of fact). In January, 1997, the United States Court of Appeals for the Federal Circuit accepted a brief on CD-ROM in a hypertext format. *See id.* at 78. The brief contained internal links which allowed the court to jump from key points to video clips of testimony and from case text to quotes. *See id.* Rather than considering the arguments of the parties in their entirety, over-burdened judges may be tempted to access only those points that appear most interesting from the summary of argument. *See id.* at 79 (explaining that the use of hypertext medium may enable a party to overcome its opponent’s power to persuade).

22. *See infra* notes 187-210 and accompanying text (evaluating the impact of different types of technology and methods of instruction on styles and techniques of learning).

23. *See* Bintliff, *supra* note 3, at 344-45 (stating that searching for information with current technology is significantly easier but does not identify essential legal issues).

improves their efficiency and access to information—it should complement, not supplement legal reasoning.

Finally, excessive emphasis on computer drills predisposes the law student to treat the law as an overly simplistic body of rules which provides a formulaic foundation for prediction.²⁴ This may appeal to extreme positivists,²⁵ ever in search of iron rules,²⁶ but it is inconsistent with the role of the common law lawyer. Using legal rules effectively consists of more than the ability to recite and apply them. As James Boyd White observed, cases represent communications and conversations,²⁷ and case analysis has generated an extensive literature on discourse, style, analysis, and rhetoric.²⁸ An understanding of the law as interpreted by the courts requires close attention not merely to isolated pronouncements but also to the

24. *See id.* at 346 (warning against technology oversimplifying the law).

Lon L. Fuller, *Reason and Fiat in Case Law*, 59 HARV. L. REV. 376, 381-82 (1946). *See generally* NEIL DUXBURY, PATTERNS OF AMERICAN JURISPRUDENCE 205-32 (1995) (investigating process jurisprudence as it was the beginning of reason, not deductive logic or intuition, as the dominant ideological framework of American legal thought).

25. Positivism is the neutral, value-free approach to the study of law as a science. *See* MARIO JORI, INTRODUCTION TO LEGAL POSITIVISM xii (1992).

26. As Lon Fuller observed, positivists crave rules and prefer to view law not as the product of contextual reason, but as fiat:

[T]he [school of] extreme positivists is hard at work to cut the fiat branch loose from reason To convert the whole of law into fiat, it is, of course, necessary to make it the fiat of some person or thing. So we find this school insisting, for example, that custom, no matter how widespread, reasonable and clearly promotive of the social welfare it may be, can never be “law” until it has been stamped as such

. . . [W]hen we deal with law, not in terms of definitions and authorization sources, but in terms of problems and functions, we inevitably see that it is compounded of reason and fiat, of order discovered and order imposed, and that to attempt to eliminate either of these aspects of the law is to denature and falsify it.

Lon L. Fuller, *Reason and Fiat in Case Law*, 59 HARV. L. REV. 376, 381 (1946). *See generally* NEIL DUXBURY, PATTERNS OF AMERICAN JURISPRUDENCE 205-32 (1995) (investigating process jurisprudence as it brought about “reason” as the dominant ideological framework of American legal thought to explain legal decision-making).

27. Professor White strenuously argued that judicial opinions are conversations that contain multiple levels of meaning:

The judicial opinion is a claim of meaning: it describes the case, telling its story in a particular way; it explains or justifies the result; and in the process it connects the case with earlier cases, the particular facts with more general concerns. It translates the experience of the parties, and the languages in which they naturally speak of it, into the language of the law, which connects cases across time and space; and it translates the texts of the law—the statutes and opinions and constitutional provisions—into the terms defined by the facts of the present case. The opinion thus engages the central conversation that is for us the law, a conversation that the opinion itself makes possible. In doing these things it makes two claims of authority: for the texts and judgments to which it appeals, and for the methods by which it works.

James Boyd White, *What’s an Opinion For?*, 62 U. CHI. L. REV. 1363, 1367-68 (1995).

28. *See generally* JAMES BOYD WHITE, JUSTICE AS TRANSLATION: AN ESSAY IN CULTURAL AND LEGAL CRITICISM 89-215 (1990) (providing an in-depth analysis of a series of judicial opinions in the context of culture and rhetoric).

court's use of language, tone, metaphor, and storytelling.²⁹

The role of the common law lawyer is to understand the breadth and limitations of rules, and to be able to argue why applying, creating, modifying or extending the rules serves the interests of justice.³⁰ Common law lawyers treat the law not as accumulated data

29. Numerous writers have commented at length and engaged in vigorous debate on the impact of style and rhetoric on legal discourse as espoused by Professor White. See, e.g., RICHARD A. POSNER, *LAW AND LITERATURE: A MISUNDERSTOOD RELATION* 270-99 (1988) (asserting that rhetoric and style can help resolve legal questions when logic and empiricism alone fail); IAN WARD, *LAW AND LITERATURE: POSSIBILITIES AND PERSPECTIVES* 3-27, 50-54 (1995) (finding that the “two kinds of law and literature—law *in* and law *as*—are in no way exclusive” and are indistinguishable); RICHARD WEISBERG, *POETHICS AND OTHER STRATEGIES OF LAW AND LITERATURE* 188, 244-50 (1992) (detailing White’s failed attempt to restore legal rhetoric); ROBIN WEST, *NARRATIVE, AUTHORITY AND LAW* 345-418 (1993) (arguing that reading opinions as literature expands understanding of the law and better equips us to mold the law towards an ideal); Frances H. Foster, *Parental Law, Harmful Speech, and the Development of Legal Culture: Russian Judicial Chamber Discourse and Narrative*, 54 WASH. & LEE L. REV. 923, 929-31 (1997) (detailing Professor White’s “two metaphors” analysis that likens a judicial opinion to: (1) a theatrical “performance” and, (2) a “conversation” between the judge and the reader, which illustrates how judicial opinions allow the court to communicate with the parties, legal commentators and the lay audience); Sanford Levinson, *Conversing About Justice*, 100 YALE L.J. 1855, 1873-78 (1991) (reviewing JAMES BOYD WHITE, *JUSTICE AS TRANSLATION: AN ESSAY IN CULTURAL AND LEGAL CRITICISM* (1990)) (criticizing Professor White’s failure to address the connection between justice and conversation among differing perspectives); Frederick Schauer, *Opinions as Rules*, 62 U. CHI. L. REV. 1455, 1474 (1995) (proposing that an analysis of whether a judicial opinion had an intended effect would yield more positive critiques than an analysis of how the opinion reads).

Much of the debate has centered around the definition of the discipline known as “law and literature.” See WARD, *supra*, at 3 (noting that in law and literature studies, there is a distinction between law in literature and law as literature, and explaining that “law in literature” focuses on the relevancy of literary texts to the study of law, while “law as literature” uses literary criticism to critique legal texts). The ultimate issue is whether such a discipline should encompass both a study of law in literature and law as literature, or whether ascribing undue significance to legal narrative is unwarranted. See *id.* at 26 (explaining how the combined study of “law in” and “law as” literature helps to clarify legal issues).

Some scholars argue, particularly in the context of constitutional adjudication, that the style and content of Supreme Court adjudication has had a negative impact on the role of informing and educating the public. See, e.g., Daniel A. Farber, *Missing the “Play of Intelligence,”* 36 WM. & MARY L. REV. 147, 149 (1994) (arguing that the Supreme Court is mired in the technical formalities of “three prong tests” and “levels of scrutiny”—losing the informative value of its opinions); see also, e.g., Morton J. Horwitz, *The Constitution of Change: Legal Fundamentalism Without Fundamentalism*, 107 HARV. L. REV. 30, 117 (1993) (arguing that the Court has increasingly relied on “highly technical formulae” or “mechanical jurisprudence” in an attempt to avoid resolving conflict between originalism and modernism and therefore failing to properly progress and thereby educate the public); Robert F. Nagel, *The Formulaic Constitution*, 84 MICH. L. REV. 165, 165 (1985) (critiquing the excessive use of “tests,” “prongs,” “requirements,” “standards,” and “hurdles” in Supreme Court opinions which distance “the Justices from both their audience, the American public, and their text, the Constitution”). These scholars argue that the role of the Supreme Court in our constitutional structure is to inform and educate the public. See *id.* at 74 (suggesting that the public is denied actual constitutional practice, but that the Supreme Court provides some alternative to the loss of self-government). For a fascinating judicial perspective, see Patricia M. Wald, *The Rhetoric of Results and the Results of Rhetoric: Judicial Writings*, 62 U. CHI. L. REV. 1371, 1386-1415 (1995) (describing the uses and effects of rhetoric in judicial opinions).

30. See James Douglas, *The Distinction Between Lawyers as Advocates and as Activists; and the Role of the Law School Dean in Facilitating the Justice Mission*, 40 CLEV. ST. L. REV. 405, 407 (1992) (stating that lawyers must have the ability to recognize the parameters of law in order to

but as the embodiment of doctrine, theory, philosophy, humanity, and emotion.³¹ The judicial decisions that exemplify the law as a tool for social change took these factors into consideration in either overturning precedent or addressing an issue in the absence of pre-existing rules.³² Encouraging lawyers to adopt technology for its own sake and to develop a working style that focuses on specific phrases rather than general concepts may divert legal problem solving away from what is just and inhibit the evolution of the common law.

This Essay does not purport to provide answers to the problems raised by the recent explosion of legal technology, but it does raise questions about whether the tools we use in the practice of law affect our work as lawyers. First, this piece surveys those legal skills traditionally associated with technology and considers how the newer

advocate effectively for legal change).

31. Most would not dispute the first three propositions. As Roscoe Pound observed in 1936:

[W]hat is to guide this judicial search for the law through trial and error? What is to hold down this judicial experimenting with tentative legal propositions in the endeavor to find the practicable precept and to define it by inclusion and exclusion through experience? . . . Our theory of judicial decision must recognize what actually takes place and why, and must endeavor to give a rational account of it. But it must also give a rational account of the check upon the process upon which we must rely for safeguarding the general security, and enable us to make that check the most effective for that purpose and yet the least obstructive of legal growth and of the individualization of decision that may be. To do this it must give us a picture of the end of the law and of the legal and social order adequate to those demands.

ROSCOE POUND, *THE FORMATIVE ERA OF AMERICAN LAW* 125-26 (1938); *see also* RONALD DWORKIN, *LAW'S EMPIRE* 285 (1986) ("A successful interpretation must not only fit but also justify the practice it interprets.").

The role of emotion in law is more controversial, and yet, deeply rooted in the decision-making process of the common law court. *See generally* ADAM SMITH, *THE THEORY OF MORAL SENTIMENTS* 21 (David D. Raphael & Alec L. Macfie eds., Oxford Univ. Press 1976) (1759) (recognizing that emotions affect judgment). For example, Smith framed the notion of public rationality by describing an impartial or judicious spectator. *See id.* at 12. The impartiality of the spectator, however, does not mean that principles are to be applied without feelings. Smith noted:

[T]he spectator must, first of all, endeavor, as much as he can, to put himself in the situation of the other, and to bring home to himself every little circumstance of distress which can possibly occur to the sufferer. He must adopt the whole case of his companion with all its minutest incidents; and strive to render as perfect as possible, that imaginary change of situation upon which his sympathy is founded.

Id. at 21. In her comments on this passage, Professor Martha Nussbaum noted that the judicious observer must have emotions to feel compassion, but noted that, "[t]o be a good guide, the emotion, first of all, has to be informed by a true view of what is going on, of the facts of the case, of their significance for all the actors in the situation, and of any dimensions of their real significance that may elude or be distorted in the consciousness of the actors." Martha C. Nussbaum, *Emotion in the Language of Judging*, 70 *ST. JOHN'S L. REV.* 23, 27-28 (1996) (discussing the need to temper emotion with reason, both of which are essential elements in judicial analysis and writing).

32. *See* Thomas B. Stoddard, *Bleeding Heart: Reflections on Using the Law to Make Social Change*, 72 *N.Y.U. L. REV.* 967, 973 (1997) (citing *Brown v. Board of Educ.*, 347 U.S. 483 (1954), *Baker v. Carr*, 369 U.S. 186 (1968), and *Roe v. Wade*, 410 U.S. 113 (1973) as creating societal change through overturning embedded doctrines).

uses of technology differ. Second, this Essay examines the uses of technology-based education and work environments and evaluates whether we have adequately assessed their impact on legal analysis in general, or on different learning and working styles in particular. Finally, it concludes that both legal educators and lawyers should be aware that “technocentrism” may encourage recitation rather than creativity, and calculated prediction rather than advocacy. We must not allow the media in which we study, read, and learn to change our legal discourse. As we adopt new methods of learning, teaching, and working, we must ensure that they do not hamper the flexibility, spirit, and humanity that have distinguished the common law.

I. LAWYERING, LEARNING, AND TECHNOLOGY

The law’s swift embrace of newly available technology is understandable. A brief overview of the technological innovations of the last twenty years suggests that many have conferred substantial benefits on the profession.³³ In particular, information technology, which is the most familiar technological advancement, gives lawyers access to amounts of legal information previously undreamed of, much of which was available only to those practicing near major university or government libraries.³⁴ Information technology expands all lawyers’ research capabilities, enabling lawyers to research international and foreign law, empowering lawyers to utilize a broader comparative framework, and fostering the growth of an international legal culture that can respond to the development of an ever-expanding global commercial structure.³⁵ Further, it provides access to factual information, much of which was previously obtainable only through an unwieldy and expensive discovery

33. See Stuart S. Nagel, *COMPUTER-AIDED JUDICIAL ANALYSIS: PREDICTING, PRESCRIBING, AND ADMINISTERING* 26-28, 290-304 (1992) (discussing how technology has helped to improve judicial decision-making and judicial administration).

34. See Rita Millican & Danny P. Wallace, *Research Needs in Academic Law Libraries*, 84 L. LIBR. J. 421, 425 (1992) (arguing that the increasing availability of information and the use of online networks at formerly “small” law libraries requires standardization of law library procedures); see also Eugene Volokh, *Computer Media for the Legal Profession*, 94 MICH. L. REV. 2058, 2059 (1996) (assessing the benefits of online information technology ranging from distribution of previously non-cost effective information to timely availability of online discussions of legal issues with professionals and academics).

35. See generally Robert O. Keohane & Joseph S. Nye, Jr., *Power and Interdependence in the Information Age*, FOREIGN AFF., Sept./Oct. 1998, at 81-82 (noting that the expanded information flow has increased the importance of nongovernmental actions); Peter B. Maggs, *Legal Data Banks in the United States and Their Use in Comparative Law*, 22 INT’L J. OF LEGAL INFO. 214, 220-27 (1994) (discussing legal data banks such as WESTLAW and LEXIS and expert systems, which answer legal questions based on a centralized system of rules, problems associated with the development of these databases in the field of international law, and the significance of databanks for the unification of law).

process.³⁶

In light of the evolution of the law, the emergence of online legal and factual databases is a predictable development.³⁷ In the earlier part of the nineteenth century, attorneys could easily read all of the year's decisions from their jurisdiction.³⁸ In fact, lawyers became

36. See generally Donald F. Parsons, Jr. and Lisa K. W. Crossland, *Technological Tools for Civil Litigation*, DEL. LAW., Winter 1996, at 33-36 (discussing how recent technological advances facilitate a higher quality work product and are "invaluable" in assisting attorneys in developing the facts of their cases).

Discontent with the expense of the discovery process is well documented. See James S. Kakalik et al., *Discovery Management: Further Analysis of the Civil Justice Reform Act Evaluation Data*, 39 B.C. L. REV. 613, 634 (1998) (arguing that in the future, the scope of discovery will be shaped by the availability of information technology); see also W. GLASER, PRETRIAL DISCOVERY AND THE ADVERSARY SYSTEM 162-88 (1968) (providing an elaboration on the specific expenses in discovery process and noting that attorney's fees contribute substantially to costs); FRANCIS H. HARE, JR. ET AL., FULL DISCLOSURE: COMBATING STONEMAN AND OTHER DISCOVERY ABUSES 81-115 (1994) (discussing stonemanning techniques that increase the opposing party's discovery costs in an effort to overwhelm opposing counsel and have the matter dropped); A. Leo Levin & Denise D. Colliers, *Containing the Cost of Litigation*, 37 RUTGERS L.J. 219, 229 (1985) (noting that discovery costs have risen as a result of the increased number of complex litigation filings). Justice Powell routinely dissented to amendments to the Federal Rules of Civil Procedure, noting that "[d]elay and excessive expense now characterize a large percentage of all civil litigation. The problems arise in significant part, as every judge and litigator knows, from abuse of the discovery procedures available under the Rules." *Amendments to Fed. Rules of Civil Procedure*, 446 U.S. 997, 999 (1980) (citation omitted).

The Civil Justice Reform Act of 1990 addressed concerns about the financial impact of delays in the discovery process by explicitly stating that each federal court adopt and implement a delay and expense reduction plan. See Civil Justice Reform Act of 1990, 28 U.S.C. §§ 471-482 (1994) (facilitating efficient, timely, inexpensive, and just resolutions of civil matters). The most recent amendments to the Federal Rules of Civil Procedure, including a requirement of automatic disclosure of all information related to facts alleged with particularity in the pleadings, are all calculated to increase efficiency and decrease the cost of litigation. See FED. R. CIV. P. 26(a) advisory committee's note (encouraging judges to identify excessive, unnecessary discovery and amend its inefficient practices). For a seminal discussion on the need for reform to facilitate the flow of information, see Wayne D. Brazil, *The Adversary Character of Civil Discovery: A Critique and Proposals for Change*, 31 VAND. L. REV. 1295, 1303-04, 1348 (1978) (noting that fundamental flaws in the discovery system have worked to impair its basic purpose and proposing that reforms are necessary).

37. See William G. Harrington, *A Brief History of Computer-Assisted Legal Research*, 77 L. LIBR. J. 543, 552-55 (1985) (discussing the evolution of both WestLaw and LEXIS and the process by which technical difficulties of both were resolved).

38. Of course, this proposition assumes that a lawyer could obtain the decisions. See GEORGE S. GROSSMAN, LEGAL RESEARCH: HISTORICAL FOUNDATIONS OF THE ELECTRONIC AGE 39 (1994) (stating that decisions were not regularly published and lawyers had to rely significantly on English law books); Craig Joyce, *The Rise of the Supreme Court Reporter: An Institutional Perspective on Marshall Court Ascendancy*, 83 MICH. L. REV. 1291, 1302 (1985) (discussing the long delay between the publication of Reporters due to the need to collect a sufficient number of cases). Even the early reports of the United States Supreme Court were unavailable. See generally WILLIAM DOMNARSKI, IN THE OPINION OF THE COURT 5-22 (1996) (discussing the history of reporting and publishing Supreme Court judicial opinions). Entrepreneur Alexander Dallas initially published Supreme Court decisions in his reports of Pennsylvania cases. See *id.* at 7 (recounting Dallas' work as a reporter). However, the reports were often criticized both for inaccuracies and the slowness of publication. See *id.* (stating that reports were published six years after an opinion and were filled with errors because Dallas took incomplete notes). Another reporter, William Cranch, experienced similar difficulties. See *id.* (explaining that these volumes were also tardy, inaccurate, incomplete, and costly). The quality of the reports improved when Henry Wheaton, a personal friend of Justice Joseph Story, was appointed in

eligible for admission to the bar through an apprentice system in which they literally “read” the law under the tutelage of an established practitioner.³⁹ Formal legal education gained popularity with the Langdellian method of teaching students to “think like lawyers” by using the Socratic dialogue and limiting readings to those contained in a casebook or prepared course materials.⁴⁰ The method emphasized an active dialogue about the reasons for a decision, how it might be applied or distinguished, and its consistency with applicable precedents, policies, and theories.⁴¹ Langdellian education was predicated on the assumption that law is a science, that its “data” consists of cases, and that the study of law facilitated orderly, near-mathematical prediction of results.⁴²

1816. *See id.* at 8. Nevertheless, the service was too expensive. *See id.* (stating that the delay was only three years, but was priced at a steep \$7.50 per volume). By 1922, the United States Government published the official United States Reports. *See id.* at 17 (explaining that the government assumed responsibility over publication only out of necessity because it could not afford to contract a publisher); *see also* Joyce, *supra*, at 1338 (commenting that Wheaton’s emphasis on quality increased production costs and made reports inaccessible to consumers). *See generally* Thomas J. Young, Jr., *A Look at American Law Reporting in the Nineteenth Century*, 68 L. LIBR. J. 294, 294-300, 305 (1975) (providing a historical overview of law reporting and how its development reflected philosophies about public production of Supreme Court opinions).

Prior to the development of the National Reporter System by John West, who undertook the work of publishing all available cases, lawyers in many states were forced to rely on journals or annotated reporters with selected cases. *See* Thomas A. Woxland, *Forever Associated with the Practice of Law: The Early Years of the West Publishing Company*, 5 LEGAL REFERENCE SERVS. Q., Spring 1995, at 115, 118-19 (detailing the start and growth of West’s reporting system). In the nineteenth century, some jurisdictions were already suffering from what members of the bar viewed as a danger of being overwhelmed by too much material. *See* REPORT OF THE COMMITTEE ON LAW REPORTING OF THE ASSOCIATION OF THE BAR OF THE CITY OF NEW YORK (1873) (recommending more expansive reporting of decisions from the jurisdiction in order to create a more complete reporting system), *reprinted in* GROSSMAN, *supra*, at 58-66.

39. *See* WILLIAM JOHNSON, *SCHOOLED LAWYERS: A STUDY IN THE CLASH OF PROFESSIONAL CULTURES* 42-57 (1978).

40. *See* Nancy L. Schultz, *How Do Lawyers Really Think?*, 42 J. LEGAL EDUC. 57, 57 (1992) (“Nearly everyone agrees—in an ‘indefinable chant whose repetition suggests sacred meaning,’—that the purpose of law school is to teach every student to ‘think like a lawyer.’”).

41. Christopher Columbus Langdell, appointed Dean of Harvard Law School in 1870, is credited by most historians as the founder of modern American legal education. *See, e.g.*, DAVID F. CAVERS, *LEGAL EDUCATION IN THE UNITED STATES* 8-10, 17-20 (1960) (providing an overview of the history of legal education in the United States and discussing Langdell’s role); CHARLES WARREN, *2 HISTORY OF THE HARVARD LAW SCHOOL* 419-21 (1908) (referring to the case method as the “Langdell System”); SAMUEL WILLISTON, *LIFE AND LAW: AN AUTOBIOGRAPHY* 71-87 (1941) (describing his experiences using the Langdellian case method while he was a Harvard law student); William Schofield, *Christopher Columbus Langdell*, 55 AMER. L. REG. 273, 273-84 (1907) (recounting first-hand observations of Langdell’s lectures, case method, published works, personal history and personality); Russell L. Weaver, *Langdell’s Legacy: Living with the Case Method*, 36 VILL. L. REV. 517, 520-44, 565-79 (1991) (outlining the development of the case method and the justifications and problems associated with its continued use); *cf.* Anthony Chase, *The Birth of the Modern Law School*, 23 AM. J. LEGAL HIST. 329, 331 (1979) (proposing that Langdell was the sole creator of the case method and other educational reforms that contributed independently to the development of the case system).

42. *See* MICHAEL J. KELLY, *LEGAL ETHICS AND LEGAL EDUCATION* 5 (1980) (“[L]aw was conceived of as a science . . . the hand maiden of a stable society.”); James E. Moliterno, *An Analysis of Ethics Teaching in Law Schools: Replacing Lost Benefits of the Apprentice System in the*

Ironically, despite its emphasis on the dispassionate dissection of cases, the Socratic method has had one very different effect on the way lawyers approach their craft.⁴³ As the amount of class time spent discussing the rationale and justness of the rules increases, law became as much an art as a science,⁴⁴ Through this method, students develop the ability to predict, critique and advocate change.⁴⁵ Although other teaching methods have also emerged,⁴⁶ few would dispute that the Socratic method remains dominant, and that it fosters resourcefulness and creativity.⁴⁷

The pure Langdellian approach initially utilized a closed universe of cases as teaching materials.⁴⁸ The method did not require, and

Academic Atmosphere, 60 U. CINN. L. REV. 83, 85 (1991) (stating that the Harvard method was based on the idea that law was a science and could be taught as such).

43. Edwin W. Patterson, *The Case Method in American Legal Education: Its Origins and Objectives*, 4 J. LEGAL EDUC. 1, 23-24 (1951) (stating that through the case method, lawyers developed legal reasoning skills and as a result, could complete other tasks such as collective analysis and legislative drafting).

44. Cf. Steven Allen Childress, *The Baby and the Bathwater: Salvaging a Positive Socratic Method*, 7 OKLA. CITY U. L. REV. 333, 336 (1982) (explaining that Socratic dialogue was more of a process than a doctrine, utilizing scientific principles of deductive reasoning and precedent).

45. See *id.* at 350 (concluding that the Socratic dialogue encourages creativity and teaches students to recognize and organize tenets and moral values).

46. See, e.g., Lloyd C. Anderson & Charles E. Kirkwood, *Teaching Civil Procedure with the Aid of Local Tort Litigation*, 37 J. LEGAL EDUC. 215, 230 (1987) (advocating the use of simulation or role playing in teaching of civil procedure); Arthur D. Austin, *Is the Casebook Method Obsolete?*, 6 WM. & MARY L. REV. 157, 165-66 (1965) (arguing for the substitution of the case method with lecture after the first year of law school); Donald B. King, *Simulated Game Playing in Law School: An Experiment*, 26 J. LEGAL EDUC. 580, 581-85 (1974) (explaining how simulated games can be used for teaching law); Gregory L. Ogden, *The Problem Method in Legal Education*, 34 J. LEGAL EDUC. 654, 657-62 (1984) (encouraging the use of the problem method in advanced legal education classes); Philip G. Schrag, *The Serpent Strikes: Simulation in a Large First-Year Course*, 39 J. LEGAL EDUC. 555, 566-69 (1989) (reporting the positive results of a year-long simulation with a model case for teaching Civil Procedure).

47. See Paul Bateman, *Toward Diversity in Teaching Methods in Law Schools: Five Suggestions from the Back Row*, 17 QUINNIPIAC L. REV. 397, 411 (1997) (stating the Socratic Method is the most commonly used classroom technique among those who teach first-year classes); Cynthia G. Hawkins-Leon, *The Socratic Method-Problem Method Dichotomy: The Debate Over Teaching Method Continues*, 1998 BYU EDUC. & L.J. 1, 5 (1998) (stating that the Socratic Method remains the primary teaching method today).

48. See David E. Engdahl, *Casebooks and Constitutional Competency*, 21 SEATTLE U. L. REV. 741, 748 (1998) (recognizing that Langdell's model of case-method law teaching consisted of "massing barely edited cases"). One critic observed that the purpose of the Langdellian approach is to "isolate and analyze the relatively few principles of the common law that the Harvard system postulated and to show how some . . . judges deviated from them." ROBERT STEVENS, *LAW SCHOOL: LEGAL EDUCATION IN AMERICA FROM THE 1850S TO THE 1980S*, at 53 (1983). Proponents of the case method laud its effectiveness in teaching students to make judgments based on individualized sets of facts. See Patterson, *supra* note 43, at 7 (crediting the case method with teaching law students legal reasoning); see also Weaver, *supra* note 41, at 550-51 (stating that critical analysis is learned by drawing distinctions between factually similar cases). Others have credited it with empowering the profession to engage in independent legal analysis. See James M. Dente, *A Century of the Case Method: An Apologia*, 50 WASH. L. REV. 93, 96 (1974) (explaining that the purpose of instructing is to empower student with skills so that in the future they can assess the law); see also Patterson, *supra* note 43, at 21 (stating that the case method requires students to synthesize subject matter independently). Critics have faulted the

gave little emphasis to, enabling students to filter, synthesize, or make judgments as to the value and weight of large numbers of conflicting authorities.⁴⁹ Ultimately, however, educators began to recognize that teaching solely from a casebook did not adequately prepare students to analyze and solve legal problems in practice.⁵⁰ They felt that lawyers needed to be able to evaluate problems not merely where a few preselected rules governed the problem, but also in the contexts of conflicting authority or the absence of authority.⁵¹ Consequently, courses focusing on legal research, writing, and analysis entered the law school curriculum in response to the need to prepare students for practice.⁵² In turn, these new curricula facilitated the rapid

method for engaging only a small number of students during a single class. See Maggs & Morgan, *supra* note 14, at 140 (“For many students the Socratic method must consist of listening to others answer questions 99% of the time and answering them themselves only 1% of the time.”); see also Austin, *supra* note 46, at 165 (arguing that student’s interest level decreases after prolonged exposure to the case method because the analysis becomes less of a challenge).

49. See Austin, *supra* note 46, at 165 (explaining that the exhaustive analysis required for each case reduced the amount of time available for considering a larger body of authority).

50. A contributing factor to this change in opinion was the advent of Legal Realism, which viewed the lawyer as a steward of justice rather than a predictor or formulator of large-scale, order-oriented social policy. See KELLY, *supra* note 42, at 10 (explaining that Realists viewed lawyers as “guardians of the democratic process”). Proponents of the school argued for the clinical method, on the theory that placing students in an environment of clients and courts better trains students to fulfill this role. See Jerome Frank, *Why Not a Clinical Lawyer-School*, 81 U. PA. L. REV. 907, 918 (1933) (arguing that the clinical method allows law students to see the “human side of administration of justice”); see also George K. Gardner, *Why Not a Clinical Lawyer-School—Some Reflections*, 82 U. PA. L. REV. 785, 800 (1934) (agreeing with Frank that some practical education is beneficial but should be in the form of apprenticeship and not law school clinic); R.J. Glennon, *Portrait of the Judge as an Activist: Jerome Frank and the Supreme Court*, 61 CORNELL L. REV. 950, 963-64 (1976) (discussing Frank’s “reforming spirit” and the necessity of reexamining accepted law if found inadequate in practical application).

51. As Professor Robert Berring observed, the law is unique from the humanities because it is based on assumed rules and norms:

Because legal researchers are so accustomed to this idea [of rules], it is difficult to realize how unique this concept is in the world of information. In most fields in the humanities or social sciences, a search of the literature will reveal certain orthodoxies or prevailing views, certain points in contention with each side having its own warrior-like adherents, but there are no points of primary authority. There are no nuggets of truth or treasure . . . Legal researchers believe that there are answers out there that are not just powerfully persuasive, but are the law itself.

Robert C. Berring, *Collapse of the Structure of the Legal Research Universe: The Imperative Digital Information*, 69 WASH. L. REV. 9, 14 (1994); see also PATRICK WILSON, *SECONDHAND KNOWLEDGE: AN INQUIRY INTO COGNITIVE AUTHORITY* 132 (1983) (arguing that professionals must also determine the trustworthiness of the information’s source when deciding whether or not information is applicable).

52. The first legal writing program was instituted by Dean Harry A. Bigelow in the 1930s at the University of Chicago Law School. See Robin K. Mills, *Legal Research Instruction in Law Schools, The State of the Art or, Why Law School Graduates Do Not Know How to Find the Law*, 70 L. LIBR. J. 343, 344 (1977) (crediting the University of Chicago with introducing the first legal methods program). Another early pioneer was Marjorie Dick Rombauer at the University of Washington. See Berring, *supra* note 51, at 25 (stating that Rombauer viewed legal research training as “an inherent part of the analyzing and categorizing function,” rather than a separate part of the first-year experience); cf. MARJORIE DICK ROMBAUER, *LEGAL PROBLEM SOLVING: ANALYSIS, RESEARCH & WRITING* (5th ed. 1991) (introducing research-oriented problem solving

integration of online information technologies.⁵³ In 1989, the American Bar Association finally began a study of the relationship between legal education and the practice of law.⁵⁴ The project produced the 1992 MacCrate Report which identified ten fundamental skills required of lawyers, including the ability to conduct legal research.⁵⁵

methods to first-year students in a textbook format). *But see* Robert F. Blomquist, *Some Thoughts on Law School Curriculum Reform: Scaling The Mountainside*, 29 VAL. U. L. REV. 641, 660 (1995) (suggesting that legal educators may ultimately cut back on skills training on the theory that law firms should take responsibility for training lawyers in research and writing). When Professor Blomquist raised this point, however, he appreciated neither the inherent value of research and writing programs to the educational process as a whole, nor the effect of market forces.

Concerning the latter point, economics is a major factor contributing to the emphasis on research training. *See* John J. Costoris, *The MacCrate Report: Of Loaves, Fishes, and Future of American Legal Education*, 43 J. LEGAL EDUC. 157, 195-96 (1993) (attributing the transformation of the legal profession into a business to economic pressures and the decreased training provided by law firms). Because of the high demand for legal services, law firms began to pay very large associate salaries. *See* Amy Dockser, *Companies Rein in Outside Legal Bills: Tactics Include Setting Budgets, Soliciting Bills*, WALL ST. J., Nov. 9, 1998, at B1 (citing the large increase in starting associate salaries due to higher legal costs). In a time of increased budget consciousness, however, employers tried to maintain their margins of profit by pressuring fewer associates to produce more work. *See* Costoris, *supra*, at 196 (emphasizing that changing economic pressures have led firms to cut costs in all areas). Employers in today's market can no longer afford the luxury of giving young attorneys an extended period of on-the-job training or mentoring. *See id.* Consequently, legal employers seek associates who possess the necessary skills to practice law from the date of their arrival. *See id.* at 171 (asserting that new associates at some firms receive such high salaries they are expected to produce billable hours immediately). Indeed, one leading survey of hiring partners in small Chicago firms indicates that 92% of the partners expected new associates to be proficient in library research, and that 84% demanded proficiency in online research. *See* Bryant G. Garth & Joanne Martin, *Law Schools and the Construction of Competence*, 43 J. LEGAL EDUC. 469, 490 (1993). In the survey, they asked partners to identify which skills should be brought to the practice by young attorneys and which should be developed. *See id.* at 472. The skills which partners listed as most important to bring to practice, as opposed to those that should be developed within practice include library legal research (92%), oral communication (91%), written communication (90%), and computer legal research (84%). *See id.* at 490. The skills listed as the least important were counseling (9%), the ability to obtain clients (8%), understanding and conducting litigation (6%), and negotiation (4%). *See id.* at 490.

53. *See* GROSSMAN, *supra* note 38, at 90 (explaining that due to massive increases in the amount of material necessary to review in most cases, lawyers viewed the computer as a critical research tool).

54. *See generally* SECTION OF LEGAL EDUC., AMERICAN BAR ASSOC., REPORT OF THE TASK FORCE ON LAW SCHOOLS AND THE PROFESSION: NARROWING THE GAP, A LEGAL EDUCATION AND PROFESSIONAL DEVELOPMENT—AN EDUCATIONAL CONTINUUM (1992) (studying the necessary skills that a legal education should provide).

55. *See id.* The skill of legal research is defined in surprisingly unambitious terms as including: knowledge of the nature of legal rules and institutions; knowledge of and ability to use the most fundamental tools of legal research; and understanding the process of devising and implementing a coherent and effective research design. *See id.*

Other skills identified as essential were legal analysis, legal reasoning, communication, problem solving, factual investigation, counseling, negotiation, litigation and alternative dispute resolution procedures, organization and management of legal work, and recognizing and solving ethical dilemmas. *See id.* at 138-40.

Finally, the report also called upon lawyers to commit themselves to the values of competent representation, promotion of justice, fairness and morality, improvement of the profession, and professional self-development. *See id.* at 140-41.

Another factor that made the legal profession receptive to online information was the sheer quantity of statutes, decisions, regulations, and legal scholarship.⁵⁶ Given the relative weight and concomitant numeric unmanageability of judicial opinions, mastery of the art of online research has been deemed necessary for sound legal analysis.⁵⁷

The first generation of computer technology emerged in the form of LEXIS and Westlaw legal databases.⁵⁸ These databases are accessible through Boolean search logic⁵⁹ and have become standard research tools, particularly among younger attorneys. More recently, the Internet expanded access to online research capability worldwide.⁶⁰ New companies, such as LOIS, offer subscriptions to

56. See Berring, *supra* note 51, at 27 (stating that in 1991 alone, approximately 60,000 cases were entered into West's printed reporters, with an additional 40,000 appearing only in electronic format, totaling approximately 100,000 new decisions each year); see also KENNETH CULP DAVIS & RICHARD J. PIERCE, JR., 1 ADMINISTRATIVE LAW TREATISE § 1.3, at 6-7 (1994) (stating that the increasing size and scope of the Federal Government may force reviewing courts to defer more to the agency decision-making process); see also THE FEDERAL COURTS STUDY COMMITTEE, REPORT OF THE FEDERAL COURTS STUDY COMMITTEE 109-31 [hereinafter FEDERAL COURTS STUDY] (recommending specific reforms of appellate court structure in light of the continued increase in the number of cases).

57. See Berring, *supra* note 51, at 16, 28-34; see also FEDERAL COURTS STUDY, *supra* note 56, at 109.

58. The two principle commercial database systems in this country are Westlaw and LEXIS. See Harrington, *supra* note 37, at 552-55 (tracing the development of LEXIS and Westlaw). See generally Jill Abramson et al., *West Publishing: The Empire's New Clothes*, STUDENT LAW., Jan. 1984, at 17 (describing the growth of the West Publishing Company). Canadian Thomson Corporation recently purchased Westlaw, along with West Publishing Co. LEXIS is owned by Reed/Elsevier. See generally Frederick Schauer & Virginia J. Wise, *Legal Positivism as Legal Information*, 82 CORNELL L. REV. 1080, 1107 (1997) (describing how the conglomeration of companies in the legal information industry has increased the availability of non-legal information from LEXIS and Westlaw). LEXIS began formal instruction in American law schools in the late 1970s, and installed its first terminal at the New York law firm of Shearman & Sterling in 1973, and Westlaw followed suit two years later. See Abramson et al., *supra*, at 19 (discussing the growth of West Publishing Company).

59. "Boolean" searching refers to the process of locating legal information by using a computer to locate words according to a formula that embodies the principal issues and ideas related to the research task. See Robert C. Berring, *Full Text Databases and Legal Research: Backing into the Future*, 1 HIGH TECH. L.J. 27, 28 n.7 (1986) (describing Boolean searches). See generally CHRISTOPHER G. WREN & JILL ROBINSON WREN, USING COMPUTERS IN LEGAL RESEARCH: A GUIDE TO LEXIS AND WESTLAW 44-45 (1994) (describing the logic connectors used in LEXIS and Westlaw searches). It is named after British mathematician, George Boole. See Marilyn R. Walter, *Retaking Control over Teaching of Research*, 43 J. LEGAL EDUC. 569, 569 n.1 (1994) (explaining that LEXIS and Westlaw search strategies are based on "principles of symbolic logic" elaborated by Boole).

60. A recent study that examined lawyers' use of the Internet concluded that 72% of legal professionals use the Internet and of those, about 53% do legal research on it. See *Legal Tech News Briefs*, February/March 1997 (last visited Nov. 24, 1998) (detailing information on the study) <<http://www.internetlawyer.com>>; see also Robert C. Berring, *Thoughts on the Future: A Steroid-Enhanced Editorial*, 15 LEGAL REFERENCE SERVS. Q. 1, 3-14 (1996) (predicting that printed legal materials will become obsolete and that LEXIS and Westlaw will differentiate and restructure themselves).

One commentator, however, remains unconvinced of the merit of Internet research, noting that "[i]t is questionable . . . whether the Internet will long survive in its current form, and it is impossible to predict what data will stay on it." ROBERT C. BERRING, FINDING THE LAW 21 (10th

Internet sites that contain primary authorities for a number of states.⁶¹ Online searches using commercial vendors are also capable of doing research that would be cumbersome and costly in print media.⁶² Seeking factual information about the subject of a case or transaction, such as a pollutant, a trademark, or an individual, is especially difficult in print sources.⁶³ Likewise, the ability to search by segment⁶⁴ makes it possible to locate easily every opinion by a particular judge.⁶⁵

This is not to suggest that the advent of online research is free of negative consequences.⁶⁶ First, online research services such as Westlaw are expensive, especially since associates in law firms often use electronic research inefficiently.⁶⁷ Second, and more importantly, online research generally highlights the factual aspects of a case rather than broad legal concepts.⁶⁸ Indeed, to fashion an online

ed. 1995). *But see* Henry H. Perritt, Jr., *Why Should Practicing Lawyers Be Interested in the Internet?*, in WHAT LAWYERS NEED TO KNOW ABOUT THE INTERNET, at 47 (PLI Patents, Copyrights, Trademarks, and Literary Property Course Handbook Series No. G4-3976, 1996) (providing a more optimistic view of the Internet's potential for legal research).

61. *See* Robert Berring, *Chaos, Cyberspace and Tradition: Legal Information Transmogrified*, 12 BERKELEY TECH. L.J. 189, 200 & n.54 (1997) (noting that the Internet-based providers, namely LOIS, offer lower rates to subscribers).

62. *See* Bintliff, *supra* note 3, at 344 (1996) (discussing the ease of online searches).

63. *See id.* at 345 (comparing print searches with computer searches which allow the searcher to search for detailed factual situations).

64. *See id.* at 344.

65. *See* Berring, *supra* note 59, at 42 (discussing the new and expanded research capabilities afforded by full-text electronic databases).

66. Despite some reservations by legal professionals, the use of online information technologies will greatly increase in the future. *See id.* at 27 (describing the increase in online products and the legal profession's reception to computers as playing a primary role in legal research).

67. *See* Joan S. Howland & Nancy J. Lewis, *The Effectiveness of Law School Legal Research Training Programs*, 40 J. LEGAL EDUC. 381, 387 (1990) (discussing how summer clerks and first-year associates, although trained in LEXIS and Westlaw while in law school, are unsophisticated and uneconomical users of the systems). It may, however, be unfair to pin the cost of online research on inefficient young lawyers when the problem is attributable to deficient training. *See* Kory D. Staheli, *Motivating Law Students to Develop Competent Legal Research Skills: Combating the Negative Findings of the Holland & Lewis Survey*, 14 LEGAL REFERENCE SERVS. Q. 195, 196 (1994) (remarking that if the legal research skills of recent graduates is declining, then law school is partly responsible because legal research training has been reduced). The difficulties in training lawyers and law students about cost efficiency often rest with the vendors themselves. *See* Walter, *supra* note 59, at 569. In most law schools, online training is provided by representatives of LEXIS and Westlaw, who are obviously motivated to emphasize the strengths of online research. *See id.* at 581 (emphasizing that computer-assisted legal research training should be put back into the hands of law school instructors because LEXIS and Westlaw representatives have little incentive to focus on economical use of the system). Additionally, in my personal experience, Westlaw and LEXIS have flatly refused to provide students with a statement of what their research would cost under a standard fee agreement, despite the fact that vendors have the software available and routinely provide search cost information to law firms.

68. *See* Bintliff, *supra* note 3, at 339, 346 (noting that the information in legal databases is organized by words making fact-based searches easier than concept-based searches and leading to a different method of thinking about legal problems).

search request around legal concepts produces an unusable aggregate of cases.⁶⁹ At the same time, because English words have many synonyms and shades of meaning, online searches inevitably miss substantial numbers of useful cases.⁷⁰ One extensive study in the mid-1980s revealed that even well-crafted searches find only twenty percent of the relevant cases.⁷¹ As Professor Robert Berring observed, online searches are better at finding “words than wisdom.”⁷² The ease of logging in from a home or office terminal, without having to go to the library, often tempts the lawyer to define a problem as one best researched online. Lawyers also all too frequently focus on a limited line of authorities that uses similar language or facts and overlook creative arguments based on analogies to broader lines of reasoning.⁷³ The process of weighing and balancing authorities becomes distorted in the absence of an enlightened, broad perspective.⁷⁴

Print sources also have distinguishing markers that are helpful in the reasoning process. Although we may not be consciously aware of it, when we pull out a bound volume of *United States Reports* and turn the pages, we are influenced by the very nature of the compilation to pay attention to the source.⁷⁵ By contrast, all bits of information look alike when presented online.⁷⁶

69. See *id.* at 346 (discussing how online research is ineffective when searching for concepts and rules).

70. See Berring, *supra* note 59, at 38-39 n.38 (describing the inability of the computer to search for synonyms of search terms).

71. See *id.* at 43 (discussing the results of a study testing the effectiveness of electronic research and noting the virtual impossibility of crafting searches that are both complete and sufficiently precise to yield even a still unacceptable figure of 40 percent of relevant cases). See *id.* (citing David Blair & M.E. Maron, *An Evaluation of Retrieval Effectiveness for Full-Text Document Retrieval Systems*, 28 COM. ACM 289 (1985)).

72. *Id.* at 46 (explaining how the inexactness of language hampers computer searches).

73. Even the most enthusiastic advocates of law and technology recognize the effects of changes in information technology on our cognitive processes. As M. Ethan Katsh observed:

A new information environment infiltrates our minds as well as our activities, although changes in thought and orientation occur more slowly and less noticeably than changes in behavior. At some point, we not only are presented with information in a new form but begin thinking about information differently because we acclimate ourselves to the new form. Thus, as electronic modes of information acquisition become commonplace, not only do we become able to obtain information about distant places but we stop thinking about distance and begin not to think of information as being in distant places. The concept and relevancy of distance change, and expectations and perspectives change.

M. Ethan Katsh, *Law Reviews and the Migration to Cyberspace*, 29 AKRON L. REV. 115, 121 (1996).

74. See Ethan Katsh, *Law in a Digital World: Computer Networks in Cyberspace*, 38 VILL. L. REV. 403, 483 (1993) (citing Virginia Wise, *Managing Information Inflation*, in EXPERT VIEWS ON IMPROVING THE QUALITY OF LEGAL RESEARCH EDUCATION IN THE UNITED STATES 125 (West Publishing Co. ed., 1992) (noting that computer research hinders researchers' ability to distinguish between sources)).

75. See *id.* at 460 (observing that as print users pull books off the shelves, looking in indexes, and turning pages, they see and feel the progress made towards their search objective).

76. This aspect of online research was raised by Gertrude Himmelfarb in a recent essay:

Nevertheless, assuming adequate training and good judgment on the part of the researcher, the increased access to information provided by online services can improve the quality of lawyering.⁷⁷ On balance, the benefits of online research appear to outweigh its drawbacks. The computer has been a democratizing force within the profession because it provides access to such a wide array of materials that have never before been available to the majority of practitioners.⁷⁸ The computer has ended the myth that a sophisticated practice is only possible in urban areas⁷⁹ and facilitated the globalization of legal practice.⁸⁰

Advances in technology have also improved communication within the profession, both inside the law office as well as with co-counsel, opposing counsel and clients.⁸¹ It is possible to join multiple

I am of two minds about the new electronic revolution. Like a great many revolutions, it is salutary-up to a point. But, like most revolutions, it tends to go beyond that point. The democratization of knowledge is all to the good, if that means the democratization of *access* to knowledge. Anyone who spends a fair amount of time in the library is grateful for a computerized catalogue that gives information not only about the books and journals in that particular library but in all the libraries in the area or even in the county. And anyone who does not have access to a major research library, or who seeks information about a public figure or event in the recent past, or who wants to read or reread a particular book review or article, will be grateful to the Internet for retrieving that information quickly and efficiently.

But democratization of the access to knowledge should not be confused with the democratization of the knowledge itself. And this is where the Internet, or any system of electronic networking, may be misleading and even pernicious. In cyberspace, every source seems as authoritative as every other. . . . The search for a name or phrase on the Internet will produce a comic strip or advertising slogan as readily as a quotation from the Bible or Shakespeare. The Internet is an equal opportunity resource; it recognizes no rank or status or privilege. In that democratic universe, all sources, all ideas, all theories seem equally valid and pertinent.

It takes a discriminating mind, a mind that is already stocked with knowledge and trained in critical discernment, to distinguish between Peanuts and Shakespeare—between the trivial and the important, the ephemeral and the enduring, the true and the false. It is just this sense of discrimination that the humanities have traditionally cultivated and that they must now cultivate even more strenuously if the electronic revolution is to do more good than bad.

Gertrude Himmelfarb, *Revolution in the Library*, AMERICAN SCHOLAR, Spring 1997, at 197, 199-200.

77. See Berring, *supra* note 59, at 41-43 (discussing the advantages and efficiencies of electronic research over that of the Digest System).

78. See Katsh, *supra* note 74, at 480 (noting that electronic databases provide a broader source of information for users than print libraries).

79. Robin Widdison, *Electronic Law Practice: An Exercise in Legal Futurology*, 60 MOD. L. REV. 143, 145 (1997) (discussing how information technology is moving the legal field from a workplace centered labor towards flexible, home-based employment and self-employment); Himmelfarb, *supra* note 76, at 199-200 (discussing the democratizing effect of the electronic revolution by providing greater access to knowledge).

80. See Widdison, *supra* note 79, at 144-45 (discussing how information technology has reduced the importance of physical distance between documents, people and places).

81. Law firms use various models of electronic communication in their law practice. See Katsh, *supra* note 74, at 428-37 (discussing group e-mails using a distribution list, group e-mails using a central computer, and multiple users individually communicating with another

discussion groups and to seek advice or obtain information from lawyers around the world.⁸² One proponent of technology even suggested that within twenty-five years, technology will fragment the profession and result in a dominance of sole practitioners.⁸³ When necessary, these practitioners will be able to form *ad hoc* firms with other lawyers to work on complex matters. The judicial process may also dematerialize into one that employs videoconferencing and e-mail, rather than a gathering of judges, lawyers, and witnesses.⁸⁴

Moreover, computers and networks in law schools facilitate communication among teachers and students, allowing productive discussion to continue outside the classroom, and empowering otherwise reticent students to express themselves and develop confidence in their analytical abilities.⁸⁵ Many teachers have noted that creating a course website or mailing list enables students who are hesitant to speak in class to engage in open discussion with the professor.⁸⁶ This is particularly important when the reluctance to speak is attributable to the student using English as a second language (a frequent concern with LL.M. students), or when a student fears disparagement of the views he or she expresses.⁸⁷ In such circumstances, the remote character of online communication may create a voice for the student.⁸⁸

E-mail does, however, have its costs. Lawyers often express concern that their clients tend to expect immediate answers from this medium of instant communication. As a result, attorneys are making less thoughtful evaluations in order to respond quickly to requests for advice. In addition, e-mail communications depersonalize the workplace because they often replace verbal communications among attorneys in the firm.⁸⁹

computer to retrieve information).

82. See *Conference Proceedings: The Development and Practice of the Law in the Age of the Internet*, 46 AM. U. L. REV. 327, 343 (1996) (remarks of John M. Kuttler, Senior Manager, Price Waterhouse Law Firm and Law Services Group, Washington, D.C. office) (discussing the availability of electronic newsgroups).

83. See Widdison, *supra* note 79, at 152.

84. See *id.* at 151-60.

85. See 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, 238 (1994) (describing the use of e-mail in facilitating communication between teachers and students).

86. See *id.* at 240 (noting that certain students may be more willing to communicate by e-mail than in a classroom with its oppressive social climate).

87. See *id.* at 241 (noting that students who prefer written work to oral communication may prefer e-mail discussions over classroom discussions, because e-mail provides a better opportunity for reflection and careful choice of words).

88. See *id.* at 240 (noting the egalitarian nature of e-mail communication).

89. See Thomas, *supra* note 85, at 244 (discussing the physically and socially isolating qualities of e-mail).

Word processing is a form of technology that has become inherently intertwined with the way lawyers write. It makes the editing process infinitely easier and permits lawyers to produce multiple drafts that refine and improve the analysis of their writings.⁹⁰ On the other hand, the tendency to edit screen by screen rather than from a printed copy may discourage the major structural and organizational changes that can improve a work product.⁹¹ The ease of writing with a computer may also foster verbosity, with the result that lawyers frequently *need* to edit their work product more substantially than previously required.⁹²

Finally, using electronic media can energize presentations.⁹³ In the law school classroom, using multi-media such as videotapes, teleconferencing, or animated portrayals can enliven a presentation.⁹⁴

90. See Lucia Ann Silecchia, *Of Painters, Sculptors, Quill Pens, and Microchips: Teaching Legal Writers in the Electronic Age*, 75 NEB. L. REV. 802, 805 (1996) (comparing modern legal writing to sculpting in which lawyers take large quantities of material, editing and whittling away to create a finished product).

91. See *id.* at 817 (discussing the benefits to editing documents from a hard copy over editing text on screen). See generally Suzanne Ehrenberg, *Legal Writing Unplugged: Evaluating the Role of Computer Technology in Legal Writing Pedagogy*, 4 LEGAL WRITING 1, 5 (1998).

92. As one judge observed:

In recent years, we have witnessed great technological advances in the methods of reproduction of the written word. . . . Too often this progress is merely viewed as a license to substitute volume for logic in an apparent attempt to overwhelm the courts, as though quantity, and not quality, was the virtue to be extolled.

TOM GOLDSTEIN & JETHRO K. LIEBERMAN, *THE LAWYER'S GUIDE TO WRITING WELL* 63 (1991) (quoting New York Court of Appeals Judge Mathew Jasen after receiving a 284 page brief). Another observer protested that,

the ease of word processing has generated a barrage of paper. American lawyers bombard each other with lengthy memoranda, attachments and appendices. The miracle of word processing has also turned many lawyers into mere technicians. . . . Due to word processing, some documents which were formally individualized are recycled from case to case and client to client

Mary Frances Edwards, Academic Director, National Judicial College, *Are Lawyers Becoming Illiterate?* 6 (June 1987) (unpublished manuscript disseminated to the International Bar Association Section on General Practice, Committee on Legal Education, Montreux, Switz.); see also LITERACY AND COMPUTERS: THE COMPLICATIONS OF TEACHING AND LEARNING WITH TECHNOLOGY (Cynthia L. Selfe & Susan Hilligoss eds., 1994) (collecting essays on writing and computers); Elizabeth Klem & Charles Moran, *Computers and Instructional Strategies in the Teaching of Writing*, in *EVOLVING PERSPECTIVES ON COMPUTERS AND COMPOSITION STUDIES: QUESTIONS FOR THE 1990S* 132-45 (Gail E. Hawisher & Cynthia L. Selfe eds., 1991) (providing interdisciplinary perspectives on writing and computers); NOEL WILLIAMS, *THE COMPUTER, THE WRITER AND THE LEARNER* 3 (1991) (outlining the beneficial and detrimental effects of computers on writing); Edward Mendelson, *How Computers Can Damage Your Prose*, *TIMES LITERARY SUPPLEMENT*, Feb. 22, 1991, at 28 (noting that the mechanics of writing on a computer damage a writer's logic and style).

93. See Ronald W. Staudt, *Does Grandmother Come with It?: Teaching and Practicing Law in the 21st Century*, 44 CASE W. RES. L. REV. 499, 511 (1994) (concluding that the use of computers in an experimental computer law class provided innovative and interactive ways of teaching substantive law which students found enjoyable).

94. Even in these cases, however, technology is not necessarily as effective as non-technological methods. For example, one of my colleagues, Professor Marc Kadish, regularly uses a short drama featuring volunteer professional actors to illustrate points in his evidence

Even something as simple as highlighting critical passages may help in structuring and organizing the information.⁹⁵

In the courtroom, a wide range of technology helps juries and judges better understand what actually happened at the time of an accident or the difference between inventions in a patent case.⁹⁶ All of these tools are useful. Lawyers should and do use them, and law schools should teach students to master them. Indeed, the good law schools already do.⁹⁷ For many reasons, the marriage of law and technology seems beneficial. Being “high-tech” became a hallmark of the forward-looking and creative individual or institution. Such uses are beneficial, however, only if they accomplish a purpose. Simply employing technology for its own sake may be the hallmark of a lemming.

II. THE COMPUTERIZED PROFESSION AND ITS EFFECTS ON THE LAW

Given the profession’s history with technology, it was a short step from using technology to *find* the law and using it to *learn* and *work* with the law. Some now argue that all legal information should be paperless and that both legal education and the lawyer’s life-long process of self-education and practice should be based upon online texts.⁹⁸ What is troubling is that there is little discussion of whether and why computer-based instruction enhances learning. In discussing this question, I use the term “computer-based instruction” to refer to the model of learning that is currently being marketed in law schools and the profession, specifically legal materials provided on a hypertext database, coupled with the encouragement that students and lawyers use laptops and databases to organize information. In some instances, the experience is also one of distance learning, where the professor is accessible only by

class. What is important in all of these instances is not that technology is per se beneficial, but that teachers can help students focus by varying their teaching methods and reaching students with visual props.

95. See Wanda McDavid, *Microsoft PowerPoint: A Powerful Training Tool*, in 5 PERSPECTIVES: TEACHING LEGAL RESEARCH AND WRITING 59 (Winter 1997) (discussing the flexibility that Power Point provides in creating effective presentations).

96. See Mark A. Dombroff, *Demonstrative Evidence and Its Effective Use in Aviation Litigation*, in GENERAL AVIATION ACCIDENT LITIGATION 311-12, 338-39 (PLI LITIG. & ADMIN. PRAC. COURSE HANDBOOK SERIES NO. 312, 1986) (discussing the illustrative use of computer reconstruction in aviation litigation).

97. See, e.g., Staudt *supra* note 93, at 506-07 (discussing Chicago-Kent College of Law’s experimental computer law class which taught students torts, criminal law, evidence, and other substantive law fields).

98. See *id.* at 502 (analogizing the enhanced learning of children through electronic storybooks to the enhanced learning of law students through interactive, electronic teaching programs); see also Ronald W. Staudt, *An Essay on Electronic Casebooks: My Pursuit of the Paperless Chase*, 68 CHI.-KENT L. REV. 291, 303 (1992) (discussing the creation of an electronic casebook).

computer.⁹⁹ Although I draw the examples that follow from the academy, my observations about the impact of electronic formats appear to apply equally to work performed by lawyers and judges.

A. *The Faces of Cyber-Prof*

Most computer-based instruction initially occurred in the context of interactive technologies designed to help students learn science and math.¹⁰⁰ Subsequently, use of this technology has expanded into new disciplines. Graduate business students at Duke University, the University of Illinois at Urbana-Champaign, and the University of Phoenix now all have remote access programs that allow students to attend classes and work on joint projects from their homes and offices.¹⁰¹ The University of Greenwich uses electronics to teach an

99. Distance learning courses may emphasize either synchronous or asynchronous learning. For a sample of asynchronous and synchronous teaching-learning opportunities in a long-distance setting, see *Asynchronous & Synchronous Teaching-Learning Opportunities* (visited Feb. 1, 1999) <<http://stc.itec.suny.edu/west/asl.html>>. In synchronous learning, students log on together with a professor at a specific time and engage in electronic discussion. *See id.* This is the form of online learning that most closely approximates the traditional classroom. *See id.* The alternative structure, asynchronous learning, allows students to access course materials and lectures at times that are convenient for them. *See id.* This is more analogous to the correspondence school of the past. Other instructional tools, such as online discussion groups, power point presentations, video clips, and electronic simulations are also made possible by technology. However, they largely represent variations of traditional teaching tools, which supplement rather than alter a teaching method and are not the subject of my concern.

100. For example, the New American Schools Development Corporation (NASDC) recently awarded \$50 million in grants in large part to improve the dismal standing of American students in these disciplines. *See* Arthur Fisher, *Crisis in Education: Part 3*, POPULAR SCI., Oct. 1992, at 68 (discussing the use of interactive technology to improve the math and science skills of students). In one program, Carnegie Mellon set up an interactive tutoring program in physics that improved grades from 30% to 80%. *See id.* Linda Roberts of the Office of Technology Assessment's Science, Education, and Transportation Program emphasized that,

In the teaching of math and science, technology brings new resources into the classroom. Students measure acid rain, track the effects of recycling household trash, and take part in a simulated mission to outer space. Technology offers enormous potential for attracting more students to science. This is because it actually enables them to "do science"—gather data, participate in experiments, work out hypotheses, and interpret findings.

Id. at 94.

101. *See* Barbara Sullivan, *On-the-run Students Log On to On-line Degree Programs*, CHI. TRIB., Oct. 28, 1996, at 1 (discussing the use of interactive technology to improve the math and science skills of students). The University of Phoenix offers four graduate and five undergraduate degrees in the computer format to a total of 2,000 students. *See id.* Some residency is required for an undergraduate degree, but graduate students "never enter the classroom." *See id.* The program uses synchronous learning, and individual classes are kept to a maximum of 13 students each to establish a personal atmosphere, even in interactive online discussion groups. *See id.*

The online nature of the courses has not reduced the cost. Tuition for a two and a half-year program at the University of Phoenix is \$20,000. *See id.* The cost of Duke University's 19 month program, entitled Global Executive Master's in Business Administration, or GEMBA, is \$79,500, including 15 weeks in residence on the Duke campus. *See id.*

economics course.¹⁰² One of the most creative approaches is a history program used at Stanford University that enables students to experience the past by playing a computer game in which they act as French landowners who must make a variety of decisions about how to influence court officials and make investments.¹⁰³

In 1983, the Massachusetts Institute of Technology (“MIT”) launched Project Athena, a computer project labeled by then-President Paul Gray as “the largest step forward in MIT’s long history of contributions to education.”¹⁰⁴ Athena was designed to computerize the learning process and to provide a broad range of services, including electronic instruction, computer communications, and modeling hardware for some of the most sophisticated engineering programs in the country.¹⁰⁵ Western Governors University plans to institute the most far reaching program: a virtual campus in which all instruction is delivered via CD-ROM, computer, television, or interactive video.¹⁰⁶

Legal education has also experienced an increased fascination with computer-based instruction.¹⁰⁷ The first applications emerged as interactive programs designed to drill those areas of law where, as in applied math and science, rules and answers exist.¹⁰⁸ The Center for Computer Assisted Legal Instruction (“CALI”) did much of this pioneering work,¹⁰⁹ promulgating exercises in fields pervasively regulated by statute including evidence, corporations, civil

102. See ALAN FREEMAN ET AL., RESOURCE-BASED PRESENTATION OF AN INTRODUCTORY ECONOMICS UNIT 8-9 (1995) (providing a description of the University of Greenwich program).

103. See Andrew Pollack, *Computer Programs as University Teachers*, N.Y. TIMES, Dec. 7, 1987, at A1 (describing Stanford’s course development efforts which provide students with opportunities through various computer simulations to facilitate learning of certain subjects).

104. See Richard Saltus, *Athena Didn’t Revolutionize MIT, But It’s Here To Stay: \$100M Project Still Short of Promise But for Many It’s Indispensable*, BOSTON GLOBE, Oct. 28, 1991, at 25 (providing an overview of the advantages of the experiment while at the same time noting problems such as the lack of interest by a large number of faculty).

105. See *id.* at 29.

106. See Karen Brandon, “*Virtual University*” *Appears Well on Its Way to Becoming Virtual Reality*, CHI. TRIB., Oct. 28, 1996, at 6 (explaining the framework of a virtual university where the traditional classroom is replaced by technology with the advantages of increasing accessibility to education and the possible restrictions of less social interaction).

107. 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, 149-50 (1997) (noting that until the 1980s, computers received little attention in the legal classroom, but that the accessibility of the Internet has introduced new opportunities for both students and teachers).

108. See *id.* at 149-50 (detailing the early efforts of law school professors to create step-by-step computer programs).

109. See *id.* at 150-51 (discussing the establishment and growth of CALI and its four main computer programs which built on the initial efforts of the University of Michigan Law School and Harvard Law School). CALI now offers more than 100 exercises in 21 different areas of the law. See Center for Computer Assisted Legal Education (last modified Sept. 26, 1996) <<http://www.cali.org.calitech.geninfo.html>> [hereinafter CALI].

procedure, and the Superfund.¹¹⁰ Other institutions have engaged in similar projects designed to help students test their knowledge and reasoning ability.¹¹¹ Indeed, as early as the mid-1970s, Professor Roger Park of the University of Minnesota Law School developed a program that incorporated hypothetical fact situations and asked students to evaluate the application of evidentiary rules relating to hearsay and character.¹¹² For his torts class, Professor Robert Keeton of Harvard Law School developed several computer lessons that were designed to help students analyze various issues in the context of specific cases.¹¹³

A more current example is the Electronic Learning or “E-Learn” project at the Chicago-Kent College of Law, Illinois Institute of Technology.¹¹⁴ All students selected for the project are required to own laptop computers.¹¹⁵ The students receive materials in print as well as in infobase formats through a program on a Folio VIEWS software platform called *The Law Student’s Desktop*.¹¹⁶ The software has features which allow students to conduct searches using Boolean

110. See CALI, *supra* note 109; see also Geist, *supra* note 107, at 141 (surveying the uses of technology by CALI and others). Geist characterizes CALI’s activities as falling into four categories:

First, there are memory drills, which are short questions requiring a yes or no answer. Second, there are tutorials, which present a greater degree of information and allow students to branch off in different directions. Third, there are simulation exercises, which attempt to recreate real life situations and require that students assume a certain role within the situation. Fourth, there are games, which are similar to simulations but involve a competitive element with several students participating at the same time.

Id. at 151.

111. See Geist, *supra* note 107, at 151-52 (noting the existence of computer-assisted legal education projects created internationally such as the British and Irish Legal Educational Technology Association (“BILETA”), a Canadian income tax program, and an Australian hypercard project).

112. See Roger Park, *How Can the Law Professor Best Use Computer-aided Exercises?*, in TEACHING LAW WITH COMPUTERS: A COLLECTION OF ESSAYS, 13, 19 (Westview Press No. 2, 1979) (analyzing a University of Minnesota Law School computer program on evidence).

113. See Robert E. Keeton, *How Do Computer-aided Exercises in Law Work?*, in TEACHING LAW WITH COMPUTERS: A COLLECTION OF ESSAYS 27, 27-39 (Westview Press No. 2, 1979) (presenting examples of tort questions on a computer program in which the computer responds to simple one-word answers).

114. See Richard A. Matasar & Rosemary Shiels, *Electronic Law Students: Repercussions in Legal Education*, 29 VAL. U. L. REV. 909, 913 (1995) (discussing a general history of the Chicago-Kent computer development). The project began with a group of 32 volunteer students during the 1994-95 academic year, and was expanded the following year to include a full first-year section, also composed of volunteer students. See *id.* at 927; see also Richard Warner, *Teaching Electronically: The Chicago-Kent Experiment*, 20 SEATTLE U. L. REV. 383, 389 (1997) (discussing how Chicago-Kent designed its project of incorporating electronic materials into a legal education).

115. See Matasar & Shiels, *supra* note 114, at 927.

116. See *id.* at 924 (explaining the computer features available to law students for analyzing, retrieving, and comprehending material).

logic and to cut and paste text.¹¹⁷ Another important feature is the hypertext link capability across files that enables students to access deeper levels of information with the click of a mouse.¹¹⁸ Thus, students who want to read the full text of an opinion rather than the edited version that appears in the electronic casebook, may jump through a pre-embedded link into the original text.¹¹⁹ Likewise, electronic texts give students the ability to jump into explanatory, illustrative, or additional material.¹²⁰

A second initiative was a telecommunications course taught to students at both the California Western and Cleveland Marshall schools of law.¹²¹ This course supplemented live, in-class sessions with electronic media such as the Internet, videotapes, videoconferencing, and an electronic casebook.¹²²

In another initiative, LEXIS-NEXIS commissioned seven professors at Harvard to create a curriculum for legal analysis, research, writing, and argument keyed to first year courses such as property and torts.¹²³

117. *See id.* at 920 (describing the electronic casebook tools which combine traditional teaching techniques with computer technology). For example, the course materials are entered in such a way as to give the student the ability to retrieve text in a variety of formats to facilitate outlining. *See id.* Such capacity includes retrieving the table of contents, retrieving highlighted portions of the text, inserting student notes into the text, or all of the above. *See id.* at 923-25. The Infobase Manager Manual distributed with version 3.1a recites the "key definitions" as including links, notes, and shadow files. *See FolioVIEWS, 3.1a Infobase Manager, in FolioVIEWS, Infobase Production Kit (on file with the author).* The utilities loaded on the system include "chop and load," "create and extract," "editlex," and "fixlink." *See id.*

118. *See Matasar & Shiels, supra* note 114, at 920, 922 (explaining that the hypertext feature is a tool for students to link information within one law subject or to combine subject areas to build individual conceptual models of the law).

119. *See id.* at 923 (noting the many additional resources made available to students through hypertext).

120. *See id.* at 922. Infobase technology, of course, is also useful for traditional tasks. *See id.* at 18 (discussing how computers may improve briefing and outlining abilities). For example, it works in tandem with information technology by giving students the capability to organize and manage the results of their electronic researching. *See id.* Thus, the technology creates a strong bias in favor of online media over print materials.

The software also contains other features, such as colored coded highlighters, for emphasizing key facts or key quotes, a "notes" feature, which enables students to add notes and comments anywhere in the infobase, and the ability to use the infobase to import and store electronic research from the LEXIS database. *See id.* at 924-26.

121. *See* Andrea L. Johnson, *Distance Learning and Technology in Legal Education: A 21st Century Experiment*, 7 ALB. L.J. SCI. & TECH. 213, 214-46 (1997) (discussing the format and findings of an electronically connected class which linked Cleveland Marshall College of Law and California Western Law School).

122. *See id.* at 215 (describing how student-to-student and student-to-teacher contacts are made through different electronic media).

123. *See* Amy Hession, *Team Creates Electronic Law-School Materials*, CHRON. HIGHER EDUC., Jan. 12, 1996, at A21 (assessing the new LEXIS program for first-year students and videotaped lectures and online discussions, assignments, and research); Chris Klein, *1Ls in Cyberspace: Harvard Joins Race to Create a Virtual Classroom*, NAT. L.J., Sept. 30, 1996, at A18 (discussing the recent programs at Harvard, Chicago-Kent, and Cornell which restructure traditional learning tools through the use of a common computer network).

According to one report on the project, “[a] long-term goal is to develop a curriculum that will replace standard courses completely and combine areas of law for study.”¹²⁴ Harvard officials characterized the program differently.¹²⁵ Associate Deans Todd Rakoff and Frank E.A. Sander wrote to the editors of the *Harvard Law Record* that, “[t]he goal, as regards new technology, is to use it where it furthers understanding, not to insert it into the curriculum for its own sake.”¹²⁶

These examples of electronic courses demonstrate the dedication and substantial effort of the professors who have utilized these new technologies. Yet with such effort and emphasis on integrating technology, one question remains: Does it work?

B. Evidence of Cyber-Prof's Effectiveness

Despite the en vogue discussion within the academy about the benefits of expanding computer-based instruction, there is little evidence demonstrating that the benefits justify the costs.¹²⁷ The profession is being wooed by the siren song that any tool that enables us to do things faster allows us to do them better.¹²⁸

Actual evidence of the effectiveness of computer-based instruction is in short supply. Mark Shields, a sociologist at the University of Virginia, characterized the claims of “techno-utopianism” as dubious, and lamented that “the pedagogical vision is blind, and technological modernization has become an end in itself.”¹²⁹ Even though there have been studies concluding that computers improve test scores,¹³⁰ a 1991 study reporting favorably on computer-based instruction contained three broad findings that should give any professor or practitioner pause.¹³¹

First, the *shorter* the time period of computer-based instruction, the

124. Hession, *supra* note 123, at A21.

125. See Todd D. Rakoff & Frank E. A. Sander, Letter to the Editor, *Professors, NOT HLS, Have “Bridge” Contract with Lexis-Nexis*, HARV. L. REC., Oct. 18, 1996, at 6 (emphasizing the experimental aspects of the LEXIS program and the fact that Harvard does not have a contract with LEXIS).

126. *Id.* Interestingly, several of the major legal publishers, including West and Aspen (formerly Little Brown) offered traditional core courses utilizing many of these same features. Notably, both West and Aspen have cut their offerings due to a lack of demand. Interviews with Eileen Breitbart, Aspen Publishing, & Bonnie Karlen, Westlaw Representative (February 1998).

127. Cf. Shields, *supra* note 15, at 30 (concluding that electronic mail and word processing are the only computer tools used consistently by a majority of the faculty, many of whom remain skeptical about benefits of computer-based teaching methods).

128. A cynic might also speculate that one reason the siren song is so seductive is that lawyers have come to equate doing things faster with making more money.

129. Shields, *supra* note 15, at 31-32.

130. See *id.* at 30 (stating that 95% of the studies are based mainly on test scores).

131. See Chen-Lin C. Kulik & James Kulik, *Effectiveness of Computer-Based Instruction: An Updated Analysis*, 7 COMPUTERS IN HUM. BEHAV. 75 (1991).

greater its benefits.¹³² Thus, while computers may prove useful in drilling discrete subject matter, they are less useful in teaching an overarching concept. As a result, computerized formats for texts and documents may not be suited to the complexities of legal analysis.

Second, most of the benefits of computer-based instruction were assessed by comparing courses taught by two different professors, where one professor had used computer-based instruction and the other had used more conventional methods.¹³³ Therefore, as Shields maintained, the differences in the test scores could have been attributable not to the method itself, but to the enthusiasm of an energetic instructor responding to a new challenge.

Finally, despite the arrival of superior technologies, the benefits of computer-based instruction have not shown a corresponding improvement over the last decade.¹³⁴ Indeed, most of the academic uses of technology today remain limited.¹³⁵ As Shields observed: "There's little basis for believing that computers have helped to alter, let alone transform, the cognitive intellectual capabilities students need to develop, . . . nor that they help nurture the ethical sensibilities which prepare students for responsible lives in civil society."¹³⁶

Consistently, some recent studies suggest that the investment of money and time in technology is often unwarranted because computers do not enhance learning and working processes.¹³⁷ For example, despite the \$100 million dollar investment in MIT's Project Athena, the head of a committee which reviewed the project concluded that over the long term, only 200 of MIT's 1,500 course offerings were influenced at all by the project, and that of those only ten "were touched in a deep and successful way."¹³⁸ A recent article in *The Atlantic Monthly* described a carefully monitored study at the

132. See Shields, *supra* note 15, at 30.

133. See *id.*

134. See *id.*

135. See *id.*

136. *Id.* Shields is not alone in his concern that the benefits of computer-based instruction may have been fundamentally overstated. For example, in the computer-based presentation of economics at the University of Greenwich, while 79% of the students said that they found the technology to be useful and flexible, 94% indicated a strong preference for "more structured, tutor-led, didactic activity in the form of lectures." See FREEMAN ET AL., *supra* note 102, at 8 (assessing a pilot project including innovations such as team teaching and computer programs to evaluate student performance).

137. See Todd Oppenheimer, *The Computer Delusion*, ATLANTIC MONTHLY, July 1997, at 45, 53 (referring to various findings that highlight the potentially damaging effects of computer-based instruction on children's development such as an inability to link different ideas or being able to utilize only left-brain sequential thinking rather than right-brain processing of different kinds of information simultaneously).

138. See Saltus, *supra* note 104, at 25-29.

elementary school level which demonstrated that a computer-assisted reading program caused a fifty percent drop in creativity.¹³⁹ As the author observed, “after 49 students used the program for seven months, they could no longer answer open-ended questions and showed a markedly diminished ability to brainstorm with fluency and originality.”¹⁴⁰ Jane Healy, a professor of education at Stanford University, noted that although the motion picture, the radio, and teaching machines were also all hailed as technologies that would revolutionize education, none accomplished this task.¹⁴¹ She wrote that computers, which primarily encourage visual stimulation, are probably not stimulating the primary access routes to reasoning.¹⁴² She also observed that computerized learning tends to “flatten” information into sequential data, exercises only the left brain, and provides much less stimulation to the right brain, where the simultaneous processing of different types of analysis that is intrinsic to creative thought occurs.¹⁴³ Anirudh Dhebar of the Harvard Business School observed that “the ease, economy and speed with which computers and increasingly sophisticated software allow us to cut and paste, calculate, format, graph and act are making a mockery of a creative and nourishing act: the thinking process.”¹⁴⁴

Although these observations sound extreme, they raise questions regarding both the utility of the computer as a learning tool,¹⁴⁵ and the extent to which computer algorithms are suitable tools in the study of law.¹⁴⁶ To the extent that computer-based instruction encourages a “quick reading for rules” approach to the study of law,

139. See Oppenheimer, *supra* note 137, at 52 (discussing the general failure of computer reading programs to provide educational benefits to children).

140. *Id.*

141. See LARRY CUBAN, *TEACHERS AND MACHINES: THE CLASSROOM USE OF TECHNOLOGY SINCE 1920*, at 109 (1986).

142. JANE M. HEALY, *ENDANGERED MINDS: WHY OUR CHILDREN DON'T THINK* 324-25 (1990) (analyzing the limited ability of computers to teach sequential exercises while failing to explore the emotional and creative aspects of a child's growth and development).

143. See *id.* at 322-25 (quoting R. Rothman, *NAEP Releases Delayed Report on Reading Test*, EDUC. WEEK, Mar. 2, 1988) (discussing the difficulties in relying on computers to teach children precise reasoning when it does not necessarily come naturally to them).

144. Anirudh Dhebar, *Of Thinking Caps and Computer Traps*, N.Y. TIMES, Mar. 26, 1995, at F13. Professor Dhebar is careful to point out in the same article that he is not a technophobe. See *id.* (promoting the democratizing characteristics of the computer while advocating more discipline in the use of technology). Indeed, he teaches marketing, and managing technology and product change at Harvard. See *id.* (describing how he advises students to think through projects before turning to the computer).

145. See *id.* (lamenting the loss of discipline, planning, and quality writing with the introduction of technological tools and easy access to large amounts of information).

146. But see Warner, *supra* note 114, at 383-86 (outlining four basic goals of legal education and concluding that computers help achieve these goals mainly through their superiority to printed materials).

students and lawyers may simply miss the depth that comes with the goal of appreciating the narrative and rhetoric of law.¹⁴⁷ While infobase technology enables lawyers to access, organize, manage, and retrieve information in both the classroom and the courtroom, there are negative effects that may extend to the learning process as a whole.¹⁴⁸

A survey at Chicago-Kent about the E-Learn project revealed that, while most of the first-year students felt positively about the experience overall, some students and faculty had concerns relating to the project's impact on the learning environment and the ability of some students to function within it.¹⁴⁹ These concerns included the background noise in the classroom, the added distraction of learning the technology, or its features, and the tendency of students to transcribe rather than participate in the class.¹⁵⁰

147. Narrative and rhetoric do have an impact on the fabric of the law. See Peter Brooks, *The Law as Narrative and Rhetoric*, in *LAW'S STORIES* 14, 15 (Peter Brooks & Paul Gewirtz eds., 1996) (promoting the importance of rhetoric and narrative in both modern and historical law perspectives, particularly at trial and in court opinions). As Peter Brooks observed:

Issues of interpretation, intentionalism, rhetoric, and objectivity have been explored from various perspectives by such scholars as Richard Posner, Stanley Fish, Ronald Dworkin, and Owen Fiss; and a number of students in both law and literature are pursuing work that crosses the borders between the two fields. More recently, another kind of intersection of law and literature has gained attention: the claim that narrative—storytelling—is a central component of legal practice and thinking.

Id. at 15.

148. See Matasar & Shiels, *supra* note 114, at 928, 931-32 (recognizing that the benefits of technology cannot be separated from new challenges such as upgrading libraries, securing staff support, and providing adequate technological facilities).

149. See PETER W. MARTIN, *THE CHICAGO-KENT COLLEGE OF LAW, THE CHICAGO-KENT COMPUTER SECTION 1995-96*, at 2, 9 (1996) (on file with the author) (noting that to both students and faculty these concerns were minimal in the overall success of the program).

150. See *id.* at 9, 10. A formal evaluation of the E-Learn Project was conducted by Professor Peter Martin of Cornell University School. See *id.* at 1 (advancing the benefits of using computer tools to teach law students in addition to traditional printed text following a year's study of the experimental program). His conclusions were based in part on observations, and in part on a survey of 68 of the 100 students participating in the project. See *id.* at 2, attachment 1. Professor Martin defined the goal of his study as follows:

Does such a substantial shift in the technology available to students for their use in performing the standard range of tasks put before them in the first year of law study make a difference? If so, in what ways? What are the gains, tradeoffs, surprises and problems associated with the pervasive use of computers that... hold a comprehensive set of course materials?

Id. at 1. Martin's survey demonstrated that only 10% of the students used the new learning environment in what Martin described as the pure form, i.e., they took notes and even read assignments in the FOLIO environment. See *id.* at 3, 4. Another 10% abandoned the project and used FOLIO only to organize online research. See *id.* at 4. Most students fell into a middle group, who made substantial use of the laptop computer, but deviated in significant ways from the parameters of the experiment. See *id.* For example, most read their assignments in print form, and referred to print materials during class discussion. See *id.* Likewise, where class discussion centered on a particular passage of text in a statute or opinion, students preferred to read the print copy. See *id.* Where, however, the course materials were specifically designed around the electronic format, such as the Contracts section with interactive exercises and tutorials, students were, both by attraction and compulsion, drawn into the E-Learn

There was also a consensus that simply taking printed text and putting it into an infobase environment did not benefit learning.¹⁵¹ This is not to suggest that the project had no merit. In those classes where professors were proficient at using the technology,¹⁵² both faculty and students found it helpful to be able to draw attention to key passages, to pose hypotheticals electronically, or to record and evaluate varying responses to a problem.¹⁵³ One must ask, however, whether these benefits justified requiring every student to buy a laptop computer and asking the faculty to devote time to incorporating technology into its courses.¹⁵⁴ One must also ask whether the benefits were largely attributable to the time the professors put into developing the new format for the course.

In view of the expanding uses of legal technology, Paul Teich reviewed the empirical research which reflected on the efficacy of computer-assisted instruction at the college level.¹⁵⁵ While Teich favored technology, even his data, provides scant basis for redesigning legal education. He relied heavily on one article which reviewed ninety-nine studies of undergraduate education to conclude that technology had positive impacts on learning skills.¹⁵⁶ On a preliminary level, twenty-one percent of the studies suggested that computer-assisted students performed better, seventy-eight percent of the studies reported no change, and only one study suggested that they actually performed worse.¹⁵⁷ Although these results were not in and of themselves significant, the authors of the article concluded that when the underlying data were subjected to statistical “meta-analysis,” it indicated that computer-assisted instruction enhanced

environment. *See id.*

With respect to the ability to create outlines, many students correctly believed that ease in generating an outline was not a benefit. *See id.* at 5. They felt they learned the most from creating an outline without the software. *See id.* The software, in their view, tended to encourage a cut and paste approach that did not necessarily foster analysis of the either individual legal concepts or the relationship between concepts. *See id.*

151. *See id.* at 7 (explaining that the majority of students would choose to have their reading assignments in print form).

152. *See id.* at 6 (noting that only one professor was proficient at using the technology).

153. *See id.* at 6, 7 (noting that more than 80% of the class characterized this technology method as “particularly effective”).

154. *See id.* at 7 (noting that although only one professor used a laptop computer in the classroom, all professors involved in the project were required to give students supplements online and had to adjust to students taking exams on their computers).

155. Teich, *supra* note 14, at 492 (concluding that computer-aided teaching methods may enhance student test scores because students are able to learn more quickly).

156. *See id.* at 492 (citing James A. Kulik, et al., *Effectiveness of Computer-based College Teaching: A Meta-analysis of Findings*, 50 REV. EDUC. RES. 525 (1980) and Chen-Lin C. Kulik & James A. Kulik, *Effectiveness of Computer-Based Education in Colleges*, 19 AEDS J. 81 (1986)).

157. *See id.*

learning by a small, but nevertheless statistically significant degree.¹⁵⁸

One wonders why we must turn to the manipulations of “meta-analysis” to find benefits. Moreover, the most striking thing about these evaluations of computer-based instruction is that all of the existing studies depend on how *students* viewed the experience. Students are not necessarily the best judges of their own performance. It is possible for a student to have enjoyed technology without benefiting from its use. Further, many of the studies cited in the article involved first-year students, who have little basis for comparing computer-based instruction with other teaching methods.

Evaluating the effectiveness of technology is also difficult because the profession generally lacks experience in measuring the effectiveness of any of the methods used to teach lawyers problem-solving skills.¹⁵⁹ For example, comparisons of the educational benefits of the Socratic method, the problem method, and the lecture method fail to demonstrate significant differences.¹⁶⁰

158. “Meta-analysis” is “a means of integrating and consolidating the results of experiments in the applied social sciences.” *Id.* at 493 n.21 (citing Gene V. Glass, *Primary, Secondary, and Meta-Analysis of Research*, 5 EDUC. RESEARCHER 3 (1976)). Teich relates a study in which students using computer-assisted instruction were assigned to an “experimental” group, while those using conventional teaching methods were assigned a “control” status. As Teich observed:

[T]he outcome of each study is converted to a common scale called an “effect size.” The effect size is equal to the difference between the mean examination score obtained by all students in all experimental groups in a given study and the mean score obtained by students in control groups, divided by the standard deviation of the control group scores

The investigator completes the meta-analysis by averaging the effect sizes of all the studies he or she has located to determine, *across the set*, whether students taught by the experimental teaching technique perform better or worse than students taught by other methods, and, if there is a difference in performance, how great the difference is.

Id.

The study concluded that the effect of computer-assisted instruction would be an “effect size” sufficient to move students from the 50th to the 60th percentile in examination scores. *See id.* (discussing a study reported in Chen-Lin C. Kulik & James A. Kulik, *Effectiveness of Computer Based Education in Colleges*, 19 AEDS J. 81 (1986)).

159. *See* Steven I. Friedland, *How We Teach: A Survey of Teaching Techniques in American Law Schools*, 20 SEATTLE U. L. REV. 1, 2 (1996) (“Conscious scrutiny about methods of teaching law is rare.”).

160. *See* John D. Blackburn & Edward Niedzwiedz, *Do Teaching Methods Matter? A Field Study of an Integrative Teaching Technique*, 18 AM. BUS. L.J. 525, 546-47 (1981) (concluding that student achievement is not influenced substantially by methodology used); Steven Hartwell & Sherry L. Hartwell, *Teaching Law: Some Things Socrates Did Not Try*, 40 J. LEGAL EDUC. 509, 522 (1990) (concluding that a study comparing essay discussion and quiz learning approaches with a control group showed only marginal differences in performance); Edward L. Kimball & Larry C. Farmer, *Law School Developments: Comparative Results of Teaching Evidence in Three Ways*, 30 J. LEGAL EDUC. 196, 208-10 (1979) (determining that the problem method was preferable overall for teaching evidence, however, there were few performance differences between students on final exams); Teich, *supra* note 14, at 491 n.12 (discussing the studies in which no significant differences between traditional legal education methods were found on examination performance); Paul F. Teich, *Research on American Law Teaching: Is There a Case Against the Case System?*, 36 J. LEGAL EDUC. 167, 184 (1986) (discussing numerous experiments comparing law

Therefore, I question whether these findings justify the current level of technocentrism. First, a legitimate question exists as to whether the “meta-analysis” of data from social science courses, which relies heavily on mean norming,¹⁶¹ applies legitimately in the context of using computer-based programs to work with legal materials. Further, both the Teich and E-Lean evaluations ignored the fact that the students in the control groups were self-selected and already

teaching methods and finding that because no conclusive answers were reached, legal educators need to end their unsubstantiated criticism of opposing teaching methods).

Some argue that the legal academy has abandoned the profession and that it has failed to prioritize teaching problem-solving skills. See Harry T. Edwards, *The Growing Disjunction Between Legal Education and the Legal Profession*, 91 MICH. L. REV. 34, 34 (1992) (criticizing legal education for its failure to give students an adequate doctrinal grounding, the necessary legal skills, or an ethical compass); Harry T. Edwards, *The Growing Disjunction Between Legal Education and the Legal Profession: A Postscript*, 91 MICH. L. REV. 2191, 2217 (1993) (responding to challenges regarding legal teaching and scholarship). But see Donald B. Ayer, *Stewardship*, 91 MICH. L. REV. 2150, 2150 (1993) (articulating the opinion that law schools and law firms are both losing their sense of stewardship for the law); Lee C. Ballinger, *The Mind In the Major American Law School*, 91 MICH. L. REV. 2167, 2169 (1993) (finding Judge Edwards’ view regarding the debilitating disease of theory to be a fundamental mischaracterization of law schools today); Derrick K. Bell & Erin Edmonds, *Students as Teachers, Teachers as Learners*, 91 MICH. L. REV. 2025, 2027-28 (1993) (defending nontraditional scholarship through a criticism of Judge Edwards’ analysis as being overbroad); Paul Brest, *Plus CA Change*, 91 MICH. L. REV. 1945, 1945 (1993) (contending that during the past 30 years legal education has not changed dramatically); J. Cunyon Gordon, *A Response From the Visitor From Another Planet*, 91 MICH. L. REV. 1953, 1954-55 (1993) (suggesting that the problems in legal practice stem from racism, sexism and elitism, rather than lack of ethics, diminishing practice capacity and lack of commitment to public service as contended by Judge Edwards); Robert W. Gordon, *Lawyers, Scholars and the “Middle Ground,”* 91 MICH. L. REV. 2075, 2077 (1993) (contending that Judge Edwards’ view of what the legal profession should look like is distressingly narrow); Sanford Levinson, *Judge Edwards’ Indictment of “Impractical” Scholars: The Need for A Bill of Particulars*, 91 MICH. L. REV. 2163, 2166 (1993) (praising Judge Edwards’ paper as accurate, however, concluding that the section on professional responsibility should have discussed the solutions that some law schools are devising to deal with the issue); Louis K. Pollak, *The Disjunction Between Judge Edwards and Professor Priest*, 91 MICH. L. REV. 2113, 2113 (1993) (suggesting the legal profession is not in as distressing shape as Judge Edwards concluded); Richard A. Posner, *The Deprofessionalization of Legal Teaching and Scholarship*, 91 MICH. L. REV. 1921, 1928 (1993) (arguing that Judge Edwards’ inability to recognize the value of new legal scholarship is a result of his excessively narrow propositions); George L. Priest, *The Growth of Interdisciplinary Research and the Industrial Structure of the Production of Legal Ideas: A Reply to Judge Edwards*, 91 MICH. L. REV. 1929, 1930 (1993) (applauding the results that an interdisciplinary structure is having on modern law schools); Paul D. Reingold, *Henry Edwards’ Nostalgia*, 91 MICH. L. REV. 1998, 2009 (1993) (noting that clinical legal education could result in the increased use of doctrine, and arguing that this approach is more positive than Judge Edwards’ critical theory approach); James Boyd White, *Law Teachers’ Writing*, 91 MICH. L. REV. 1970, 1970 (1993) (rejecting Judge Edwards’ characterization of ‘theoretical’ and ‘practical’ as a division for legal scholarship); Barbara Bennett Woodhouse, *Mad Midwifery: Bringing Theory, Doctrine and Practice to Life*, 91 MICH. L. REV. 1977, 1997 (1993) (finding the disjunction between law schools and the profession is not caused by theory, as Judge Edwards contends, but actually is caused by the lack of attention paid to the interplay of theory, doctrine, and practice).

161. See James A. Kulik, et al., *Effectiveness of Computer-based College Teaching: A Meta-analysis of Findings*, 50 REV. EDUC. RES. 525, 527 (1980) (describing meta-analysis methodology as including the location of studies on a particular issue based on specific procedures, quantitative and substantive analysis of those studies and use of “multivariate techniques to describe findings and relate characteristics of the studies to outcomes”).

tended to be more comfortable with computers than the average student.¹⁶² They also ignored the likelihood that these students came from the ranks of families that were either more affluent and had had more educational opportunities, or were more oriented toward expending family resources on education.

Other data raise further questions. The study evaluating the computer-based economics course at the University of Greenwich noted that in all teaching contexts, computers are *most* effective when used to supplement rather than to supplant conventional instructional and learning methods.¹⁶³ Consistently, some observers have suggested that when computers are used in a supplementary role, learning has improved simply because the total time students have devoted to the subject increased.¹⁶⁴

Even more troubling, a recent study at Ohio State University concluded that using computer-generated slides and visual effects to present classroom material may actually harm learning. As the author of that study concluded:

When a class is taught with the teacher's lecture notes presented in a computer slide show, . . . it seems the students feel that all the authority comes from the computer. Instead of paying attention to what the teacher is saying, they just copy down what they see on the computer screen. They dissociate themselves from the class and become passive observers rather than actively participating in the learning experience.¹⁶⁵

In addition, computer exercises are difficult and time-consuming to devise.¹⁶⁶ Incorporating computer instruction often forces a teacher to devote substantial effort to redefining the objectives of the course. Thus, computers alone do not make better teachers; rather the time and energy required to create computer exercises may

162. Concededly, each new class that arrives is progressively more comfortable with computers. My point, however, is that the control groups in these studies had a pro-technology bias.

163. See FREEMAN ET AL., *supra* note 102, at 22 (stating that the most radical and effective use of computers involves combining teaching space for computer laboratories and class discussion).

164. See Paul Hagler & James Knowlton, *Invalid Implicit Assumption in CBI Comparison Research*, 14 J. COMPUTER-BASED INSTRUCTION 84, 85 (1987) (reasoning that studies concluding that computer-based instruction had a positive effect on test scores and learning had more to do with the increased time spent studying than on the superiority of computer-based learning).

165. Jon Van & Jon Bigness, *Research Suggests Those Flashy Computer Slides May Be Stealing the Show*, CHI. TRIB., Mar. 2, 1998, at C2 (quoting Andrea Huff, a lecturer at Ohio State University).

166. See Russell Burris, *The Authoring Process and Instructional Design*, in TEACHING LAW WITH COMPUTERS: A COLLECTION OF ESSAYS 43, 49 (Russell Burris et al. eds., 1979) (explaining that the design of effective computer-aided instruction ("CAI") programs involves fundamental and complex considerations of subject matter structure, knowledge and skill, teaching and learning processes, and technological design).

compel teachers to improve the focus of their instruction.

Finally, many educators can recount anecdotal evidence that technology may harm the learning process by altering work patterns. When I teach Civil Procedure, I typically distribute ten sets of "Points to Remember" throughout the semester to help students define fundamental terms and concepts and to structure their course outlines. Generally, seventy-five to eighty percent of the students have commented on their class evaluations that they found these handouts very useful.

One year, I decided to post the "Points" on our law school network so that students could simply download them into their notes at their convenience. I did not distribute hard copies. In the end, few students read the "Points" until exam week. Only three out of one hundred students mentioned the "Points" at all on their student evaluations and several complained that they were having trouble "connecting" concepts. Several students did mention that they later accessed the "Points" during reading period, yet the exams results were the poorest I have ever received.

This experience suggests several things. First, students do not access information on the computer to the same degree as they do with a printed page. Second, students appear to equate the ability to access the material with mastery of the material. They view downloaded information as learned information. Third, their failure to access and to think about the information at the time it was presented in class may have done more than merely delay their command of the subject matter; it may have permanently impaired it. Despite this, however, using more technology is a persistent theme in both legal education and practice.¹⁶⁷

In sum, both law firms and law schools have spent huge sums of money incorporating technology into the legal environment. Yet, there is little evidence that such technology produces higher quality work product.¹⁶⁸

C. Technology and Learning Styles

The learning and working styles of lawyers remain woefully under-

167. For example, an upcoming meeting of the Institute for Law Teaching at Gonzaga University School of Law lists no fewer than seven workshops dedicated to bringing more technology in the classroom. See *Legal Reference Librarians* (visited Feb. 24, 1999) <<http://www.ljx.com/public/maillinglists/wwwlawlibref-I/725.html>> (summarizing the purpose of E-Teach and subscription information).

168. See Charles H. Wilson, *Planes, Trains and . . . Civility*, A.B.A. J., Jan. 1990, at 77, 78 (providing anecdotes about how technology has negatively affected work product).

explored.¹⁶⁹ Law schools select professors and law firms hire attorneys based on their performance in law school, but law professors and lawyers generally have little or no background in cognitive learning or education theory. Although a complex psychological analysis is beyond the scope of this Essay, even a cursory review of the learning theory literature raises concerns about whether computer-based instruction improves the learning process. First, consider the general processes of learning and thinking. At the most basic levels, these processes involve: (a) receiving and encoding; (b) remembrance, categorization, and retrieval; (c) judgment and choice; and (d) the intricate thought processes required for solving complex problems.¹⁷⁰ The question for lawyers and law professors concerned about learning and teaching ever-increasing amounts of information is how computer-based instruction may positively or negatively affect our ability to perform at each of the stages mentioned above.

The first process, receiving and encoding, has a profound impact on the way that students will be able to remember, retrieve, and evaluate information.¹⁷¹ It is also the aspect of legal study that may be most affected by working with materials in an electronic format. Mary Potter, a behavioral psychologist at MIT, explained that shallow reception and encoding means that information and ideas are easily forgotten, and will not have a long term impact on the thinking process.¹⁷² A number of factors may influence the extent to which information is deeply encoded. For example, we deeply encode when we receive information with an awareness that it is important or when the information is surprising.¹⁷³ Memories are linked or connected either by the frequency with which they are associated, or by temporal contiguity.¹⁷⁴ As Professor Potter observed: “Things that

169. There have been, however, some recent studies on how lawyers and law students read. See Dorothy H. Deegan, *Exploring Individual Differences Among Novice Readers in a Specific Domain: The Case of Law*, 30 *READING RES. Q.* 154, 161 (1995); Mary A. Lundberg, *Metacognitive Aspects of Reading Comprehension: Studying Understanding in Legal Case Analysis*, 22 *READING RES. Q.* 407, 417-32 (1987).

170. See Mary C. Potter, *Remembering* to 3 *AN INVITATION TO COGNITIVE SCIENCE* 3, 4-12 (Daniel N. Osherson et al. eds., 1991) (discussing the functions of memory from encoding to retrieval); Edward E. Smith, *Introduction*, in *AN INVITATION TO COGNITIVE SCIENCE* 1 (stating that the basic aspects of thought are categorization, judgment, choice and problem solving).

171. See Potter, *supra* note 170, at 4 (noting that retrieving stored information “depends on just how it was encoded, on what other information is in storage and on the circumstances of the retrieval attempt”).

172. See Potter, *supra* note 170, at 5-6 (“[P]aying attention to visual appearance or sound of a word resulted in a shallow level of encoding that is easily forgotten, whereas paying attention to meaning results in a deeper and richer representation.”).

173. See *id.* at 8 (discussing why some ideas and information are encoded more deeply and hence better memories are formed).

174. See *id.* at 10-11 (explaining the limits of temporal contiguity and its relevance to preparedness and frequency or practice).

happen together are more likely to share some intrinsic or causal relationship than are things that happen at different times, increasing the likelihood that the association will be useful in discovering patterns and predicting events.”¹⁷⁵ This notion is moderated by the principle of temporal proximity, which restricts the number of associations that can be made.¹⁷⁶ Potter noted, “imagine the mental chaos that would result if all the thoughts that passed through your mind within any one-hour interval were fully interconnected in memory, so that each one reminded you of all the others!”¹⁷⁷

Although no formal studies have been done, common sense suggests that the electronic environment has an impact on the way students encode. Students with a laptop computer in the classroom, or lawyers with one in the courtroom, often transcribe rather than engage in selective note-taking. As they receive information, they need not make judgments as to the relative importance of concepts, since they possess its ability to get everything entered. Unfortunately, this means that, at the time of reception, the encoding may be shallow and the associative links between important thoughts and concepts will be weakened.¹⁷⁸

Computer-based instruction may also affect the second phase of the process, remembrance, categorization, and retrieval. The impetus for a human memory is the stimulus of a present experience which triggers the memories of similar experiences; for that reason, our minds store memories and ideas according to content.¹⁷⁹ When

An extreme example of the latter is the so-called “flashbulb” memory that enables us to remember every detail of what we were doing at the time of some critical event, such as hearing of President Kennedy’s assassination or the Space Shuttle Challenger disaster. Roger Brown & James Kulik, *Flashbulb Memories*, 5 COGNITION 73 (1977).

175. Potter, *supra* note 170, at 10.

176. *See id.*

177. *Id.*

178. Legal education requires increased emphasis on contextualized reading. *See* Peter Dewitz, *Legal Education: A Problem of Learning from Text*, 23 N.Y.U. REV. L. & SOC. CHANGE 225, 246-47 (1997) (explaining the reading process and suggesting ways for professors to accelerate learning).

179. Computer science refers to this as *content addressing*, a means of information retrieval that starts with at least a part of content of the topic on which the mind seeks information. *See* Potter, *supra* note 170, at 14, 15 (exploring how content-addressing “finds” memories by their identification to similar material). If a person forgets the content address of information, the human mind has the capability to take the inquiry to the “neighborhood” of the target information. *See id.* at 15 n.3. Ironically, computer algorithms, despite advances in artificial intelligence, do not store information according to content addressing, but rather use arbitrarily assigned numeric designations. *See id.* Utilizing the concept of “content addressing” does not mean that memories are found in a particular molecule or neural group, rather, memories are contained in “fluctuating patterns of synaptic connections” throughout the brain’s neural net. *See* James Geary, *A Trip Down Memory’s Lanes: Scientists Are Mapping the Many Winding Paths Memory Takes in the Brain*, TIME, May 5, 1997, at 42 (contradicting the belief that

encoding is shallow, as with the classroom or courtroom “transcriber,” the correlative ability to locate and link information is also compromised.¹⁸⁰ The transcriber need not evaluate information at the time it is received.¹⁸¹ This conflicts with the fact that a system built on decisional law is, in its very nature, suppose to define rules according to the context of the case in which they are framed.¹⁸²

Finally, the third stage of the process and very core of legal reasoning—reflection, judgment, and problem solving—is equally influenced by a system of shallow encoding. Indeed, in an apparent validation of the Socratic dialogue, psychologists point out that one way information becomes a part of working knowledge is to talk about it or, in a process familiar to most anxious law students, to rehearse talking about it mentally, while the professor tests the knowledge of another student.¹⁸³ When information is encoded and categorized according to hierarchy and association at the time it is received, it also becomes a part of the semantic knowledge that we use to make general and predictive observations.¹⁸⁴

Once again, we are left with a concern that working methods that allow lawyers and students to input now and think later may be harmful to those who give in to the temptation. The person who uses an infobase to cut and paste portions of a case text into a brief is

memory is stored in the brain similar to filing cabinets in a warehouse, and instead finding that the entire brain is responsible for memory).

180. For a general description of content addressing and memory, see J.L. Freedman & E.F. Loftus, *Retrieval of Words from Long Term Memory*, J. VERBAL LEARNING & VERBAL BEHAV. 10, 107-15 (1997).

181. In one study, an instructor in an undergraduate writing course used a local area network. Although she started with the assumption that the network conversation would be similar to that in a normal classroom, the actual experience differed. The pace of the class slowed, and she found that, as the instructor, she dominated the electronic conversation and its content. See Ann Hill Dun & Craig Hanson, *Reading and Writing on Computer Networks, as Social Construction and Social Interaction*, in EVOLVING PERSPECTIVES ON COMPUTERS AND COMPOSITION STUDIES, *supra* note 92, at 89, 104 (acknowledging that students could not simultaneously read and write, therefore participation in a network computer class decreased).

182. Cf. Martin Davies, *Reading Cases*, 50 MOD. L. REV. 407, 421 (1987) (“The primary source of the common law is the text, and no text has meaning without a readership. There is no apodictic ‘true legal meaning’ . . .”).

183. See CLAIRE E. WEINSTEIN, *Assessment and Training of Student Learning Strategies*, in LEARNING STRATEGIES AND LEARNING STYLES 291, 293 (Ronald R. Schmeck ed., 1988); cf. ROGER C. SCHANK, TELL ME A STORY: A NEW LOOK AT REAL AND ARTIFICIAL MEMORY 115-17 (1990) (maintaining that in order to remember experiences people need to tell someone else, otherwise the components mix with new experience information).

184. See SCHANK, *supra* note 183, at 118 (discussing the organization of semantic memory as hierarchical with subordinate information being stored around general concepts). Again, this is not to suggest that information technology has a negative influence. In enabling deep and contextual reading, the capabilities of information technology can prove extremely helpful. For example, Fajans and Falk note that “[t]he wide accessibility of news and information data banks like NEXIS and Westlaw makes it possible for students to assemble a context ‘dossier’ on any significant case in the last ten years.” Elizabeth Fajans & Mary R. Falk, *Against the Tyranny of the Paraphrase: Talking Back to Lenta*, 78 CORNELL L. REV. 163, 196 (1993).

rearranging the thoughts of others, rather than reading “closely, critically, and multiperspectively.”¹⁸⁵

This working style often produces a superficial level of understanding and masks the fact that the reader has missed the larger questions about the reasoning behind the decision. Such a reader may have at most recorded a result, which is not the same as *knowing* the law.¹⁸⁶ The student who types during class, and waits until the evening, the weekend, or exam week to return to the data will encode at progressively shallower levels, categorize with less insight, and ultimately be handicapped at using information that has not become a part of semantic knowledge.

Another equally well-recognized psychological truth cuts across all of these general observations about how we work, learn and remember: we all have different learning styles. We remember differently, think differently, and use our cognitive processes to draw conclusions differently. I strongly suspect that some learning styles may be harmed by a wholesale adoption of computer-based instruction and work methods. While an examination of the complexities of learning theories is beyond the scope of this Essay, some basic principles are well accepted and instructive.

On the broadest level, learning theorists recognize that one of the most fundamental differences in learning styles and preferences may be described as *global* on one end of the continuum, and *analytic* on the other.¹⁸⁷ Neither style is inherently good or bad; they simply represent differing approaches to learning. Indeed, beyond this dichotomy, some argue that the optimal learning style is really a versatile style that combines the best attributes of both methodologies.¹⁸⁸ Yet, most individuals have certain predilections, and a cursory review of the characteristics of each style suggests that integrating technology into education will affect these different

185. Cf. Fajans & Falk, *supra* note 184, at 181.

186. Cf. *id.* at 183 (describing methods by which teachers can test and assist students in reaching a deeper level of meaning for the information they are reading).

187. See Ronald Ray Schmeck, *Strategies and Styles of Learning: An Integration of Varied Perspectives*, in *LEARNING STRATEGIES AND LEARNING STYLES* 317, 328 (Ronald R. Schmeck ed., 1988) (describing the differences between people with analytic styles and those with global styles). As Schmeck noted, other authors have described cognitive learning styles differently, using terms such as holistic versus serialist, right versus left-brained, field dependent versus field independent, and global versus articulated. He argued, however that “at some level of abstraction [sic] [all of these] are reflections of a single dimension,” for which he adopts the global versus analytic designation. *Id.* at 327 (summarizing characterizations by fellow authors of cognitive learning styles).

188. See *generally* NOEL JAMES ENTWISTLE, *STYLES OF LEARNING AND TEACHING* 3-4 (1981) (asserting that there is no single best way to teach because people differ in their intellectual abilities, attitudes and personality).

learning styles in various ways.¹⁸⁹

For example, global learners are most comfortable scanning large amounts of information and looking for patterns and relationships.¹⁹⁰ They are at ease with uncertainty during the learning process and do not adhere to precise rule formulations. Rather, they engage in what theorists term “deep learning” by forming links or associations between concepts they have encountered or “encoded.”¹⁹¹ Because their learning does not depend on developing an ordered system of study, global learners think intuitively and do not hesitate to factor their feelings into the decisions they make.¹⁹² Psychology professor Ronald Schmeck observed that “the global style and its strategies employ simultaneous processing,” which he characterizes as involving “the coding of a set of information into a unitary representation which is . . . quasi-spatial in nature.”¹⁹³ Because of their reluctance to proceed with decision-making and learn in a structured way, extreme global thinkers may fail to examine facts critically as they are presented and are content to read and learn through expectation and prediction.¹⁹⁴

These factors adversely affect the reading comprehension scores of

189. See Gordon Pask, *Learning Strategies, Teaching Strategies, and Conceptual or Learning Style*, in *LEARNING STRATEGIES AND LEARNING STYLES*, *supra* note 187, at 83, 99 (observing that constraining an individual to one learning strategy is counter-productive and counter-intuitive while the versatile style, i.e. the absence of a rigid style, is the best cognitive style).

190. See Schmeck, *supra* note 187, at 328 (“Individuals with a global learning style are field dependent with attention tending toward scanning, leading to the formation of global impressions rather than more precisely articulated codes.”).

191. See *id.* (describing individuals with the global style of learning as processing information randomly as opposed to linearly and sequentially); see also John R. Kirby, *Styles, Strategy, and Skill in Reading*, in *LEARNING STRATEGIES AND LEARNING STYLES*, *supra* note 187, at 229, 259 (explaining the differences between global, analytic, and synthetic styles of understanding).

192. See Schmeck, *supra* note 187, at 328 (commenting that global learners analyze with emotion and feeling). Other indicators also focus heavily on the degree to which individuals make decisions intuitively. The popular Myers-Briggs Type Indicator test, for example, classifies individuals as either an “e” (extrovert) or “i” (introvert), an “s” (sensing) or “n” (intuitive), a “t” (thinking) or an “f” (feeling), and finally, a “j” (judgment-making) or “p” (perceiving) person. See GEORGE H. JENSEN & JOHN K. DiTIBERIO, *PERSONALITY AND THE TEACHING OF COMPOSITION 2-7* (1995) (explaining the historical development of the Myers-Briggs Type Indicator test and the psychological types identified by the test). Using a similar test oriented to children, psychologists concluded that the composition process was dramatically different for differing personality types. “S” or “sensing” children, for example, had considerably more difficulties with writing than “I” or “intuitive” types. See Rochelle L. Ferdman & John K. Tiberio, *Psychological Type and the Writing Process of Fifth Graders*, 38 *J. PSYCHOL. TYPE* 24, 24 (1996) (finding that particularized strategies based on psychological type are helpful in assisting children with writing difficulties). While a brief review of the literature does not refer to any studies finding that the Myers-Briggs test is a definitive indicator of learning style, research of the increasing use of Myers-Briggs might offer researchers an opportunity to evaluate student learning styles.

193. Kirby, *supra* note 191, at 244.

194. See *id.* at 249 (discussing the global phase of reading development as too dependent on context, and relying far too much on expectation and prediction).

beginning readers with global tendencies.¹⁹⁵ Once the global reader learns the discipline of focusing on the precise meaning of the written word, however, the ability of the global thinker to summarize and draw larger conclusions improves.¹⁹⁶ Students who tend toward global learning styles do not adapt well to competitive learning environments, such as those that unfortunately exist in most law schools.¹⁹⁷ Because global learners are disinclined to focus on rules in their learning and reasoning processes, the aggressive conditions in some classrooms motivate these students to become dependent on someone or something that will provide rules to them.¹⁹⁸ While there is a paucity of data on the subject, my suspicion based on observation is that most law students are not global learners.

By contrast, analytic thinkers tend to review information systematically, analyzing whether a preliminary hypothesis is the correct one.¹⁹⁹ They are controlled, disinclined to integrate feelings into the thinking process, logical, and likely to learn in a sequential process.²⁰⁰ It is not necessarily a “better” style of learning.²⁰¹ Even though focused on facts and data, analytics tend to review less information because they lose interest in the fact-finding process once they find a set of facts that supports their initial hypothesis.²⁰² They also risk “surface” learning.²⁰³ Deeper learning, after all, requires the ability to step back from the process and see the relationships between concepts, components, and ideas.²⁰⁴ Analytics are reluctant to delve into “deeper learning” and tend toward study for the purpose of identification, where global learners are more comfortable assigning deeper levels of meaning.

195. See Schmeck, *supra* note 187, at 332 (arguing that most students begin as global learners and are not as successful).

196. See *id.* at 332 (noting that the point at which global readers are better able to focus on the analysis of written words signifies the appropriate time to reintroduce the global skills, which are a necessary part of higher-level reading skills).

197. See *id.* at 333 (asserting that global learners became uneasy when faced with independent choice or a competitive atmosphere).

198. See *id.* (explaining that global learners are more comfortable in a competitive environment if they are able to rely on rules provided by some form of authority).

199. See *id.* at 328 (discussing findings that extreme analytics tend to examine less data by systematically searching to prove or disprove a particular theory provided).

200. See *id.* (finding analytic thinkers are able to focus their attention on data and facts, thereby removing emotion and feeling from their analysis).

201. See *id.* (arguing that neither style is better, but instead that a combination of styles allows for the most successful learning).

202. See *id.* at 329 (arguing that analytics absorb less information, while global learners are more comfortable with greater amounts of information and are better able to recognize trends and patterns).

203. See *id.*

204. See *id.* at 330 (explaining that the deepest learning comes from evaluating critically both surface facts and deeply imbedded information).

How does an analytic style influence the process of legal education? Although this has not been studied, an analytic law student who has met some measure of success as an undergraduate by focusing on memorization may be uncomfortable predicting results by synthesizing diverse and often conflicting decisions. Doing so requires the global skills of examining irreconcilable doctrines, theories and policies, and combining these concepts with other lawyering skills and values. Unfortunately, lawyers and law professors are not sensitive to the impact that learning style can have on the ease with which one masters the law.²⁰⁵ My own observation suggests that computer-based instruction may be particularly ineffective and even harmful to analytics. I have observed that law-byte capability harmfully predisposes analytics to focus on particular sources that support a viewpoint, rather than examine issues from a broader perspective.

Finally, some people are beginning to raise questions as to whether a computer-based environment has a disproportionately adverse impact on women.²⁰⁶ A recent article in *The Chronicle of Higher Education* observed that formats that facilitate distance learning tend to be even more impersonal than large lecture courses.²⁰⁷ To encourage participation, many instructors either devise interactive exercises with right and wrong answers, and set up bulletin board discussions in a debate format in which women are less likely to participate.²⁰⁸ Perhaps these concerns will become less prevalent as students arrive at law school having already adapted their learning styles to computer-based instruction.²⁰⁹ What remains, however, is

205. See Friedland, *supra* note 159, at 2 (asserting that there has been a lack of analysis of teaching techniques and learning styles because it is taken for granted that legal education is successful).

206. See JUDY WAJCMAN, FEMINISM CONFRONTS TECHNOLOGY 150-53 (1991) (discussing how the traditional male monopolization of machines and technology has been extended to computers through their use in schools); Cheris Kramarae, *Technology Policy, Gender, and Cyberspace*, 4 DUKE J. GENDER L. & POL'Y 149, 151 (1997) (arguing that instructors often offer computer training to men while ignoring women); see also Gayle Binian, *Feminist Jurisprudence and the First Amendment: Hearing Another Voice*, S. CAL. REV. L. & WOMEN'S STUD. 269, 271 (1998) (explaining that even in the early stages of childhood, boys are encouraged to utilize computers while girls are encouraged to stay away from them); Colin Covert, *Cyberspace Remains a Masculine Environment*, MPLS STAR TRIB., Nov. 13, 1995, at 1A ("Women are a tiny minority in almost every aspect of computer culture, from programing, to product design, to everyday use.").

207. Goldie Blumenstyk, *A Feminist Scholar Questions How Women Fare in Distance Education*, CHRON. OF HIGHER EDUC., Oct. 31, 1997, at A36 (stating that women are more likely to learn better in a classroom where there is discussion among the professor and students).

208. See *id.* While it is true that e-mail may give a voice to students who are reluctant to speak in class, this is most observable in the case of private communication with the professor. Reticent students, according to Blumenstyk, are especially unwilling to post to public discussion lists. See *id.*

209. See Richard Warner et al., *Teaching Law with Computers*, 24 RUTGERS COMPUTER & TECH.

whether the obsession with technology for its own sake will make us better lawyers.²¹⁰

III. TECHNOLOGY AND THE SOUL OF THE LAW

Beyond evaluating the value of technology, there is a deeper concern: Does a medium for legal education that compels lawyers to focus on right or wrong answers equate effective lawyering with calculation? After all, lawyers must do more than simply mechanically retrieve the thoughts and writings of others.²¹¹ Rather, they must become proficient in creating their own ideas about how to solve problems and be able to predict and influence future results.²¹²

Lawyers must understand a great deal about law and, most particularly, must understand that it is more than a compilation of rules. Lawyers must comprehend the implications of language,²¹³ social context,²¹⁴ morality,²¹⁵ and emotion,²¹⁶ as they bear on the

L.J. 107, 109-10 (1997).

210. See William T. Braitwaite, *How is Technology Affecting the Practice and Profession of Law?*, 22 TEX. TECH L. REV. 113, 114-15 (1991) (arguing that many lawyers and professors are more concerned with the powers of technology than its effect on lawyering skills and the profession in general).

211. See Linda Morton, *Teaching Creative Problem Solving: A Paradigmatic Approach*, 34 CAL. W. L. REV. 375, 377-79 (1998) (describing successful lawyers as those who are able to focus on future events and problem prevention by use of creative analysis).

212. See Marjorie Anne McDiarmid, *Lawyer Decision Making: The Problem of Prediction*, 1992 WIS. L. REV. 1847, 1880-81 (arguing that to solve legal problems practitioners must construct accurate predictions of future events); Roy T. Stuckey, *Education for the Practice of Law*, 75 NEB. L. REV. 648, 667-71 (1996) (describing legal problem solving as a sequence of critical decisions based on prediction of future results).

213. See generally LAWRENCE M. SOLAN, *THE LANGUAGE OF JUDGES* 28-63 (1993) (describing the role linguistic theory plays in understanding legal issues). The question of law as language has spawned a rich literature. Representative works include: Denis J. Brion, *Saying the Law in States*, in *CITIZENS AND QUESTIONS OF SIGNIFICANCE* (John Brigham & Roberta Hevelson eds., 1996); STANLEY FISH, *DOING WHAT COMES NATURALLY: CHANGE, RHETORIC, AND THE PRACTICE OF THEORY IN LEGAL AND LITERARY STUDIES* 4 (1989) (arguing there is no literal meaning to words without context and interpretation); JOSEPH GOLDSTEIN, *THE INTELLIGIBLE CONSTITUTION* 35, 40-41 (1992) (defining the Supreme Court's obligation to make the language of opinions clear for judges and the public); DAVID MELLINKOFF, *THE LANGUAGE OF THE LAW* 11-12 (1963) (explaining that it is impossible to understand the law without understanding the language lawyers employ); WHITE, *supra* note 28, at 215-25 (distinguishing between law as rules and law as dialogue); Clark D. Cunningham, *A Linguistic Analysis of the Meaning of "Search" in the Fourth Amendment: A Search for Common Sense*, 73 IOWA L. REV. 541, 550-608 (1988) (analyzing the Fourth Amendment by using a semantic framework); Wayne Eskridge Jr., *Dynamic Statutory Interpretation*, 135 U. PA. L. REV. 1479, 1481 (1987) (arguing that statutory language, like the common law and the Constitution must be interpreted by taking several factors into account, including modern interpretation); Karl N. Llewellyn, *Remarks on the Theory of Appellate Decision and the Rules or Canons About How Statutes are to be Construed*, 3 VAND. L. REV. 395, 401 (1950) (illustrating how attorneys must have a firm grasp of legal vocabulary to be persuasive).

214. See generally ARISTOTLE, *NICHOMACHEAN ETHICS* 143-45, 165-66 (Terence Irwin trans., Hackett Publ'g 1985) (384-322 B.C.) (ethical reasoning requires a grasp of experience and context); MARTHA C. NUSSBAUM, *THE FRAGILITY OF HUMAN GOODNESS: LUCK AND ETHICS IN GREEK TRAGEDY AND PHILOSOPHY* 290-317 (1983) (interpreting Aristotle and his belief that the

resolution of legal problems.

To illustrate, it is helpful to focus on the tasks of the lawyer. One of the most common tasks is that of analysis.²¹⁷ Because legal rules often conflict, such conflicts can be resolved only by understanding and weighing the policies underlying such rules. Further, cases often purport to articulate rules, but in truth articulate standards.²¹⁸ Because lawyers more often deal with analysis in terms of applying standards to cases, decision-making requires a deeper level of

judges of human condition should deliberate based on context and experience rather than on rules or principles); Lawrence Lessig, *The Regulation of Social Meaning*, 62 U. CHI. L. REV. 943 (1995) (examining social meaning and the effects of legal policy on social meanings); Joseph William Singer, *Persuasion*, 87 MICH. L. REV. 2442, 2443-44 (1989) (discussing the importance of placing legal disputes in social context).

215. The doctrinal use of morality is long established, forming the basis of policies regulating health, safety, and moral concerns. For example, in *Bowers v. Hardwick*, 478 U.S. 186 (1986), the United States Supreme Court upheld antisodomy laws to preserve the traditional moral view that homosexuality is wrong. In terms of legal theory, ontological political and legal theories have long occupied a prominent place in the literature. See JOHN RAWLS, *POLITICAL LIBERALISM* 30-32 (John Dewey Essays in Philosophy No. 4, Columbia Univ. Press 1993) (explaining the two kinds of moral identity, political and nonpolitical, and the need for each citizen to adjust and reconcile them); David A.J. Richards, *Kantian Ethics and the Harm Principle: A Reply to John Finnis*, 87 COLUM. L. REV. 457, 464 (1987) (discussing the Kantian rejection of "perfectionist" moral theories because they espouse a philosophy that urges rejection of much needed common goods in a free society).

216. See Martha C. Nussbaum, *Aristotle, Feminism, and Needs for Functioning*, 70 TEX. L. REV. 1019, 1022 (1992) ("[E]motions . . . [play] a crucial role in the rational and virtuous response to many of life's events."). See generally Susan Bandes, *Empathy, Narrative, and Victim Impact Statements*, 63 U. CHI. L. REV. 361 (1996) (discussing the positives and negatives of using narratives in legal decision making); Martha C. Nussbaum, *Equality Mercy*, 22 PHIL. & PUB. AFF. 83, 110-11 (1993) (comparing judges who treat an offender as one who is the by-product of a complex web of situations and emotions with judges who treat offenders as an object with no individual state of mind, merely an actor that needs to be deterred). In many scenarios, such as the distinction between murder and manslaughter, the concept and context of an emotion may be the determinative legal question in a case. See generally Dan M. Kahan & Martha C. Nussbaum, *Two Conceptions of Emotion in Criminal Law*, 96 COLUM. L. REV. 269, 272-73 (1996) (discussing ways of treating emotion in law and differences between mechanistic and evaluative concepts of emotion).

217. See Kurt M. Saunders & Linda Levine, *Learning to Think Like a Lawyer*, 29 U.S.F.L. REV. 121, 152 (1994) (observing that the primary tasks of lawyering are problem solving and analysis).

218. But see Antonin Scalia, *The Rule of Law as a Law of Rules*, 56 U. CHI. L. REV. 1175, 1183 (1989) (arguing that the creation of general legal rules, applicable to all persons and situations is more sound than reliance on an individualized totality of the circumstances standard). See generally FREDERICK SCHAUER, *PLAYING BY THE RULES* 77-78, 135-45 (1991) (discussing the distinctions between rules and standards in the decision-making process); Louis Kaplow, *Rules Versus Standards: An Economic Analysis*, 42 DUKE L.J. 557, 559-60 (1992) ("[A] rule may entail an advance determination of what conduct is permissible, leaving only factual issues for the adjudicator. . . . A standard may entail leaving both specification of what conduct is permissible and factual issues for the adjudicator."); Frederick Schauer, *Rules and the Rule of Law*, 14 HARV. J.L. & PUB. POL'Y 645, 649-58 (1991) (describing the role rules play in the application of legal doctrine); Pierre Schlag, *Rules and Standards*, 33 UCLA L. REV. 379, 383-96 (1985) (clarifying the debate between rules and standards by outlining the pros and cons of each); Kathleen M. Sullivan, *The Supreme Court 1991 Term—Foreword: The Justices of Rules and Standards*, 106 HARV. L. REV. 24, 56-94 (1992) (discussing the Supreme Court's application and interpretation of constitutional rules and standards in landmark cases).

understanding for which law-byte analysis is not suitable.

Another common task is persuasion.²¹⁹ As any lawyer knows, persuasion requires more than restating the rules. An effective lawyer must understand and use the theory and policy of an argument. An overwhelming majority of practitioners, teachers, and scholars would agree that in the art of persuasion, an effective lawyer must also understand and use the contexts in which rules arise to bring the audience to the conclusion that fairness and justice dictate that a person in the client's situation must prevail.²²⁰ The lawyer who does not read legal information in context will be ineffective. Earlier attempts to make legal information more accessible concededly had similar effects. Lawyers who in the past read only headnotes failed to comprehend the legal and policy implications of a decision, and almost certainly did not begin to understand the role of semiotics, emotion, or even bias in a case.²²¹ Such a *modus operandi* is only encouraged by the influx of technology in the legal profession. In urging lawyers to utilize technology for its own sake, we are encouraging a hypertext, jump-link analysis and exacerbating the problem of shallow thinking.

To illustrate, in *Plessy v. Ferguson*,²²² the United States Supreme Court held that a state statute requiring separate seating for whites and non-whites in railroad cars did not violate the Equal Protection

219. As Professor Joseph Singer observed:

Lawyers spend a lot of time attempting to persuade other people. They persuade judges to promulgate rules of law that favor their clients. They persuade their law partner to adopt their interpretation of existing law or to adopt their strategy for litigation. They persuade clients to accept the dictates of the law. They persuade adversaries in settlement negotiations and their client's business associates in contract negotiations. They persuade legislatures to fund legal services for the poor.

Singer, *supra* note 214, at 2442. See generally SONYA HAMILTON, WHAT MAKES JURIES LISTEN (1985) (describing effective techniques of persuasion in dealing with juries); PIERRE SCHALG & DAVID SKOVER, TACTICS OF LEGAL REASONING (1986) (discussing the most common and most persuasive means of attacking a legal argument); LOUIS J. SIRICO, JR. & NANCY L. SCHULTZ, PERSUASIVE WRITING FOR LAWYERS AND THE LEGAL PROFESSION (1995) (describing persuasive legal writing techniques); Jerry Frug, *Argument as Character*, 40 STAN. L. REV. 869, 872 (1983) (asserting that legal argument must be examined under a framework of rhetorical analysis); James Boyd White, *Law as Rhetoric, Rhetoric as Law; The Arts of Cultural and Communal Life*, 52 U. CHI. L. REV. 684, 685 (1985) ("A modern law school is, among other things, a school in those arts of persuasion about justice that are peculiar to, and peculiarly effective in, our legal culture.").

220. See Singer, *supra* note 214, at 2454-56 (arguing that in order for persuasion to occur relationships must develop through the use of empathy and context and must be personalized to the audience).

221. See Fajans & Falk, *supra* note 184, at 163 (finding that to be effective, students and practitioners must be able to move beyond text and "link text to larger context[s]").

222. 163 U.S. 537 (1896) (holding that a state legislature may pass laws requiring the separation of the races in its exercise of general police power), *overruled by* Brown v. Board of Educ., 347 U.S. 483 (1954).

Clause of the Fourteenth Amendment.²²³ A noncritical reading of the case and mechanical applications of its rule would arguably have perpetuated a society of forced segregation.

Fortunately, in subsequent actions, the plaintiffs convinced the Supreme Court that this rule should not be applied mechanically.²²⁴ In *Missouri ex rel Gaines v. Canada*,²²⁵ Missouri argued unsuccessfully that it could exclude an African-American applicant from law school if it paid his tuition to an integrated law school in Illinois.²²⁶ Similarly, in *Sweatt v. Painter*,²²⁷ Texas unsuccessfully sought to bar admission of minorities from the University of Texas law school by constructing a separate educational facility for minority applicants.²²⁸

In holding that Texas had acted unconstitutionally, the Court gave several reasons why the *Plessy* rule did not apply, including the fact that *Plessy* denied equality of opportunity; that it was not a precedent deserving broad application; and that it was unjust and shameful.²²⁹

The extent to which these factors—shame and a desire to achieve justice—should and did influence litigation and ultimately resulted in *Brown v. Board of Education*,²³⁰ can be debated elsewhere.²³¹ The question is whether a lawyer who is trained to utilize legal sources reduced to the unquestioning recitation of hypertext nuggets will fully appreciate the social consequences of legal debate.

Another example reflecting why law-byte analysis is inappropriate comes from a story related by Professor Joseph Singer in his article, *Persuasion*.²³² There, Professor Singer described his frustration at students' reaction to a decision in a case involving a plant closing:

A factory has operated in a city for more than fifty years. The city has grown up around the factory and has come to rely upon it, as have its employees. The company has benefited enormously from its long-term relationship with the workers and the community. Yet the company appears unconcerned for their welfare. Instead, its officers focus on the bottom line; their only goal is to maximize

223. See *id.* at 544.

224. See, e.g., *Brown*, 347 U.S. at 493-95; *Cooper v. Aaron*, 358 U.S. 1, 5-7 (1958).

225. 305 U.S. 337 (1938).

226. See *id.* at 349-50 (holding that if a state provides education or training, denial of that training based solely on race is unconstitutional).

227. 339 U.S. 629 (1950).

228. See *id.* at 635-36 (deciding that the state's action was unconstitutional due to the fundamental inequalities between the University of Texas law school and law school founded solely for African-Americans).

229. See *id.*

230. 347 U.S. 483 (1954).

231. See generally Duncan Kennedy, *Freedom and Constraint in Adjudication: A Critical Phenomenology*, 36 J. LEGAL EDUC. 518 (1986) (describing the process of adjudication when a legal rule conflicts with the decision-maker's desired outcome).

232. See Singer, *supra* note 214, at 2447.

profits and returns to shareholders. Ruled by a distant and seemingly unapproachable board of directors, the company closes the factory, putting thousands of people out of work, many of them permanently. The city faces a crisis. Many people experience downward mobility. Even most of those who find work face reduced living standards. All of the workers face grave difficulties in putting their lives back together. It is a story of betrayal. The workers trusted the company and depended on it. The company lived off that trust, took advantage of it, and finally, abused it. Yet most of the students did not see it that way. On the contrary, although they believed that plant closings were regrettable, many of them understood the closings to represent a rather happy story—the efficient restructuring of production through the invisible hand of the free market.

* * * *

This situation worried me, but not because most of the students disagreed with my particular law reform proposal. It worried me as a teacher that my students failed to understand that many courts would understand plant closings as hard cases. Although they could easily recite doctrinal and policy arguments on behalf of the workers, they seemed unaware that some judges would react sympathetically to those claims. It was partly a matter of professional competence: they could not competently represent a company in a plant closing case if they could not see, and feel, the power of the arguments on the other side. To do a good job representing either side, they had to understand this to be . . . a hard case.²³³

How much more limited might the discussion have been if the students had simply scrolled through the case to find the holding and cut and pasted it into their property law outlines? The fact that lawyers now research cases looking for isolated word combinations exacerbates this tendency. Given that lawyers and law students often have “refused to acknowledge context—to acknowledge the actual lives of human beings affected by a particular abstract principle,”²³⁴ how much difficulty will students have in a method of study that

233. *Id.* at 2445, 2447-48. Singer attempted to give his students a sense of context by reading an announcement in class that the law school had decided to address the lawyer competency problem by adopting a policy of failing one-third of the entering class, and asking students to formulate what arguments they might have in a lawsuit to enjoin the school from changing the grading policies that were in effect at the time of their admission. Singer found that this approach was successful in enabling the students to place the arguments for the plant workers in context. *See id.* at 2454.

234. Mari Matsuda, *Liberal Jurisprudence and Abstracted Vision of Human Nature: A Feminist Critique of Rawl's Theory of Justice*, 16 N.M. L. REV. 613, 619 (1986).

emphasizes hypertext-linked rules and discourages the close reading of cases. Students who cannot understand the stories of the law cannot understand the law.²³⁵ And yet, can we reasonably expect legal readers to understand stories and contexts when the profession constantly seems to value the use of tools and methodology that emphasize speed and rule extraction over depth and reflection? Perhaps there are those who view the law's highest and best calling as sterile formalism.²³⁶ If the profession and society, however, want to make that choice, it should be a choice and not a byproduct of a rush to computer-based platforms for learning and work.

Finally, when we work with the law in a format that encourages formalism and rule extraction, do we retreat from dialogue about policy and theory? Even without the allure of technology, commentators have already expressed concern that law students do not read legal texts deeply enough, and that their inability to engage in "close reading" impairs their ability to use precedents creatively in the lawyering process.²³⁷ As Elizabeth Fajans and Mary Falk observed, it is not enough to train students to produce documents "superficially comparable to those a practitioner might produce. [Students also must] appreciate the dialogues and debates that occur within the discourse community, to contribute to the 'ongoing conversation of the law.'"²³⁸

One also wonders whether the law's embrace of technology will have an impact on the intellectual richness, flexibility, and justness of the common law. Does excessive reliance on the use of technology overly emphasize rules and certainty at the expense of other goals and qualities we value in lawyering and the legal system: creativity,

235. See Fajans & Falk, *supra* note 184, at 204-05 (asserting that in order for lawyers to contribute effectively to the developing legal discourse they must be able to think independently of text); cf. Martha Minow, *Stories in Law*, in *LAW'S STORIES*, *supra* note 147, at 24, 36 (arguing that the reemergence of stories is welcomed as the "healthy disruption" in an often static legal doctrine); White, *supra* note 219, at 691-92 ("[L]aw is a way of telling a story about what has happened in the world and claiming a meaning for it by writing an ending to it.").

236. See Scalia, *supra* note 218, at 1178-81 (arguing for the creation of general principles, as opposed to reliance on fact-based discretion, because of the greater predictability rules allow and because such rules empower judges to be courageous and stand up to popular opinion). *But see* Frederick Schauer, *Precedent*, 39 *STAN. L. REV.* 571, 588-91 (1987) (describing the consequences of blindly following precedent without concern for context).

237. See Fajans & Falk, *supra* note 184, at 163 (arguing that the legal profession, at all levels, requires more than merely scanning and paraphrasing opinions). Professors Fajans and Falk used a number of innovative teaching techniques to get students to engage in close reading, to read beyond the rules needed for case briefing for what is "implicit [on the page]-literary style and jurisprudential or interpretive posture—and for what is not there at all—legal and historical context and omission of fact or lapses in logic." *Id.* at 169. Once their students mastered close reading, the students approached writing assignments with far more maturity and creativity. *See id.* at 169.

238. *Id.* at 171.

justice, equity, compassion, and the ability to discover our common fundamental values?

I do not pose this question lightly because the issue arises in multiple contexts. Every day courts must address values in cases requiring constitutional interpretation,²³⁹ or the evaluation of transactional fairness,²⁴⁰ or reasonableness in the area of torts.

239. See JOHN HART ELY, *DEMOCRACY AND DISTRUST* 43-70 (1980) (discussing how the Supreme Court is charged with applying fundamental principles and how it defines values). In his chapter on fundamental values in the context of constitutional interpretation, Ely notes that a multiplicity of factors and concepts may come into play in the decision-making process, including the judge's own values, natural law, reason, tradition, consensus, and the neutral principles outlined by Herbert Wechsler, *Toward Neutral Principles of Constitutional Law*, 73 HARV. L. REV. 1, 19 (1959) (arguing that the Supreme Court should apply that same principle to like cases).

The exploration of values as an evolving concept in the constitutional context has been the subject of extensive discourse. While the originalist versus responsivist interpretation debate remains, the classic statement of the responsivist position is that of Justice Holmes:

[W]hen we are dealing with words that are also a constituent act, like the constitution of the United States, we must realize that they have called into life a being the development of which could not have been foreseen completely by the most gifted of its begetters. It was enough for them to realize or to hope that they had created an organism; it has taken a century and has cost their successors much sweat and blood to prove that they created a nation. The case before us must be considered in the light of our whole experience and not merely in that of what was said a hundred years ago.

Missouri v. Holland, 252 U.S. 416, 433 (1920). For other examples discussing this viewpoint, see ROBERT C. POST, *CONSTITUTIONAL DOMAINS—DEMOCRACY, COMMUNITY, MANAGEMENT* 35-38 (1995) (discussing the implications of the responsive interpretation); Karl N. Llewellyn, *The Constitution as an Institution*, 34 COLUM. L. REV. 1, 14-15 (1934) (stating that the action and attitudes of men give life to the Constitution); Hanna Pitkin, *The Idea of a Constitution*, 37 J. LEGAL EDUC. 167, 169 (1987) (writing that the Constitution is what we make of it and depends upon what we do).

The inclusion of a values analysis is at least as old as the distributive/corrective justice dichotomy from Aristotle, and it describes the role of justice in determining resource allocation. See II ARISTOTLE, *On Particular Justice*, in *THE COMPLETE WORKS OF ARISTOTLE: THE REVISED OXFORD TRANSLATION* 1784-85 (Jonathan Barnes ed., 1984) (writing that a particular kind of justice is presented in the allocation of resources and that awards must be given according to merit). As a modern commentator has observed:

[T]here are problems of *distributing* resources, opportunities, profits and advantages, roles and offices, responsibilities, taxes and burdens—in general, the *common stock* and the *incidents of communal enterprise*, which do not serve the common good unless and until they are appropriated to particular individuals.

JOHN FINNIS, *NATURAL LAW AND NATURAL RIGHTS* 166 (1980). Corrective justice, as a general rule, would appear more likely to be resolvable using rule oriented thinking, since what are involved are not questions of the allocation of social resources, but rather questions arising in conjunction with relations between individuals. See *id.* Not surprisingly, it has been in conjunction with this type of issue, and in courses like contracts and evidence, where computerized instruction has been most successful and least controversial.

240. See generally Larry A. DiMatteo, *The Norms of Contract: The Fairness Inquiry and the "Law of Satisfaction"*, 24 HOFSTRA L. REV. 349, 432 (1995) (discussing the evolution of contract law and the inclusion of questions of fairness and moral considerations); James Gordley, *Enforcing Promises*, 83 CAL. L. REV. 547, 613 (1995) (arguing that courts will not enforce promises that enrich one person at the expense of another without prudent reason to do so); Thomas Lee Hazen, *The Corporate Persona, Contract (and Market) Failure and Moral Values*, 69 N.C. L. REV. 273, 307-14 (1991) (discussing the role of values and relevance of moral theory in the analysis of corporations); Duncan Kennedy, *The Role of Law in Economic Thought: Essays on the Fetishism of Commodities*, 34 AM. U. L. REV. 939 (1985) (discussing aspects of nineteenth-century economic

Is the ability to locate “law-bytes” and to chain-cite legal authority the objective of lawyers and legal educators, or should we have grander goals? The question is one of special importance in a common law system where the day to day tasks of lawyering affect the actual process of creating law.²⁴¹ The way in which we work with the law is eminently capable of influencing the law’s development.²⁴² Adopting even the most positivist of stances—that legal rules in a positivist world must derive only from defined sources—it nevertheless becomes apparent that changes in the methods by which lawyers work and gain access to information will produce changes in the law.²⁴³

Has the profession confronted the fact that new technologies are tools that will alter our methods, modes, and culture of decision making? Does the use of computers to teach, read, and work with the law make lawyers and judges less likely to consider policy, theory, justice, values, and emotions? Justice Scalia might argue that the law

thought in relation to law); G. Richard Shell, *Substituting Ethical Standards for Common Law Rules in Commercial Cases: An Emerging Statutory Trend*, 82 NW. U. L. REV. 1198, 1199 (1988) (stating that courts have increasingly decided business disputes by relying on ethical standards); Eyal Zamir, *The Inverted Hierarchy of Contract Interpretations and Supplementation*, 97 COLUM. L. REV. 1710, 1723 (1997) (stating that any interpreter of a contract would be required to take into account public values and parties).

241. The impact of lawyering on the development of the law is of unique importance in the common law system. Common law judges depend upon lawyers acting within the adversary system to inform and suggest legal arguments. See HERBERT JACOB ET AL., COURTS, LAW, AND POLITICS IN COMPARATIVIST PERSPECTIVE 29 (1996). But see Teich, *supra* note 14, at 496. Professor Teich cited the Kulik, Kulik & Cohen study for the proposition that computer-assisted instruction has in fact been more effective in the “soft” disciplines of the humanities than it has been in the “hard” disciplines of science, mathematics, engineering, and agriculture. See *id.* Teich, however, while a proponent of computer-assisted instruction, suggests that this surprising fact is explainable by the following: teachers in these disciplines are more frequently trained in behavioral analysis and make better use of the programs, students in the “hard” disciplines often are already achieving at or near their maximum potential, and the use of computers in soft disciplines requires instructors to define clearly the objectives of each class, something that soft discipline teachers do not always otherwise do. See *id.* at 496-97.

As Daniel Goleman observed:

Conventional wisdom among cognitive scientists entails a cold, hard-nosed processing of fact. It is hyperrational, rather like *Star Trek’s* Mr. Spock, the archetype of dry information bytes unclouded by feeling, embodying the idea that emotions have no place in intelligence and only muddle our picture of mental life. The cognitive scientists who embraced this view have been seduced by the computer as the operative model of mind, forgetting that, in reality, the brain’s wetware is awash in a messy, pulsating puddle of neurochemicals, nothing like the sanitized, orderly silicon that has spawned the guiding metaphor for mind.

DANIEL GOLEMAN, EMOTIONAL INTELLIGENCE 40-41 (1995).

242. See Schauer & Wise, *supra* note 58, at 1103-08 (positing that the nature of law and the definition of legal positivism are in the process of a change motivated by the increasing amounts and types of information used by decision makers).

243. See *id.* at 1105-08 (arguing that more extensive access to online information technology is changing the law by causing more reliance on non-legal information).

should disregard such values.²⁴⁴ Others would argue that mercy, compassion, equity, and emotion do belong in the law.²⁴⁵ The jurisprudential debate need not be resolved here. What is important is that hypertext minds and hypertext analysis may be so fixated on mechanical identification of rules that they will likely not consider these questions at all.

For good or ill, lawyers occupy positions of extraordinary power and importance in our society to a degree unimaginable in civil law jurisdictions. The fabric of the law itself is shaped by the decisions of courts, and lawyers have outdistanced all other professions in occupying places of importance within society's political power structure.²⁴⁶ Given this context, legal educators and mentors in the profession have a special obligation to foster work cultures that encourage broad perspectives. We should strive for illumination and deplore superficiality,²⁴⁷ and we should use processes that inspire lawyers to make virtues and values a part of the decision-making process.²⁴⁸ We do not serve the law well by using technology in a way that assumes right or wrong answers, and does not encourage legal analysis that is critical, inquisitive, novel, moral, equitable, and just.

244. See *Morgan v. Illinois*, 504 U.S. 719, 739-52 (1992) (Scalia, J., dissenting) (arguing that jurors who hold a subjective belief that the death penalty is a proper punishment can still make an impartial decision during the sentencing phase of a capital murder case). For a spirited debate on the role of values in legal analysis, compare Martha C. Nussbaum, *Valuing Values: A Case for Reasoned Commitment*, 6 YALE J.L. & HUMAN. 197, 209-17 (1994) (arguing that values have a place in justifying legal rules), with Pierre Schlag, *Values*, 6 YALE J.L. & HUMAN. 219, 222 (1994) (arguing that values are too easily appropriated by any force, and too vulnerable to manipulation).

245. See Stephen P. Garvey, "As the Gentle Rain from Heaven": *Mercy in Capital Sentencing*, 81 CORNELL L. REV. 989, 991-92 (1996) (arguing that the Supreme Court does not understand mercy's place at the penalty phase of capital trials); cf. Kyron Huigens, *Virtue and Inculcation*, 108 HARV. L. REV. 1423, 1462-67 (1995) (arguing for individual determination in criminal cases).

246. Two-thirds of all U.S. Presidents have been lawyers. See CONGRESSIONAL QUARTERLY, GUIDE TO THE PRESIDENCY 1401-02 (Michael Nelson ed., 1989); THE WORLD ALMANAC AND BOOK OF FACTS 1998, at 530 (Robert Famighetti ed., 1998) (describing briefly the biographies of all the presidents).

247. See Linda R. Hirshman, *Nobody in Here But Us Chickens: Legal Education and the Virtues of the Ruler*, 45 STAN. L. REV. 1905, 1930-35 (1993) (arguing that there are good reasons to address the morality of law).

248. See *id.* at 1909 (questioning whether legal education devotes sufficient attention to what she terms two possible virtues of rulers: "empathy, the capacity to care about the lives of individuals different from oneself; and, liberality, the virtue of giving what one owns to the right people for the right reason").