WILL VIDEO KILL THE RADIO STAR?* VISUAL LEARNING AND THE USE OF DISPLAY TECHNOLOGY IN THE LAW SCHOOL CLASSROOM

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This Article examines the advantages and disadvantages of using display technology to teach law. Display technology is computer-generated images and text used to supplement visually what the professor is saying verbally in class. Modern law students come from an age dominated by visual images—computers, the Internet, television, blockbuster films, pervasive advertising, etc.—but law school is taught largely the same way it has been for over one hundred years, with a professor standing at a podium and asking only verbal questions to a large class of students. Many law schools are adapting their physical classrooms to accommodate the use of display technology, but law professors in general lag behind society and other education professionals in using display technology to teach. Also, legal educators are generally falling behind the legal

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* This phrase is borrowed from the 1979 pop song "Video Killed the Radio Star," performed by The Buggles, which is a song acknowledging the power of the then emerging visual medium of music videos being played on television stations such as Music Television ("MTV"). As one of the first songs made into a music video—and, significantly, the very first music video played on MTV—the song questions whether music videos played on MTV would destroy the music stars of the sound-only medium of radio. Of course, this dire prediction never actually transpired, as MTV actually increased the sales of the pop music industry. *See* Laura Landro, *Record Industry Finding Financial Revival in Promoting Artists on Video Music Shows*, WALL ST. J., Nov. 19, 1982, at 33 (noting that while record sales had declined since 1978, album sales of artists aired on MTV increased by 15 to 20 percent); *see also* Frank Young, *Are You a Walking Advertisement?*, L.A. TIMES, Dec. 28, 1992, at B4 (proposing that certain MTV shows are aired "strictly" for the purpose of increasing compact disc ("CD") and audio cassette sales). Music videos also made it possible for musicians to enhance their art and further communicate with their fans. *See generally* Jay Cocks, *Sing a Song of Seeing*, TIME, Dec. 26, 1983, at 54, 56 (quoting Billy Joel, an MTV pioneer whose music videos were considered "elaborate and effective," as saying, "The musician in me really resents having to interpret my music into something visual, . . . [b]ut the thing that outweighs all of that is that video is a form of communication. Why not use every means of communication available?").

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profession itself. Modern trial lawyers regularly use display technology, such as computer animations, videotaped depositions, and PowerPoint presentations, to "teach" and persuade juries, judges, and colleagues in a very effective way.

This Article uses sociological and psychological research as well as learning theory to examine different in-class learning styles and concludes that there are significant advantages to teaching through the combination of images, text, and verbal discussion. Display technology gives the professor more access to the student's brain: two senses—sight and hearing—are accessed instead of only hearing, thereby enhancing understanding, retention, and recall. To the extent some law professors have begun to use display technology, many do not use it to its full potential or make critical mistakes. This Article addresses these problems and offers helpful methods to avoid them.

This Article also addresses common criticisms of using display technology to teach, such as it "dumbs down" class or it makes students and professors passive. These criticisms often have more to do with pedagogical mistakes than with inherent problems in using the display technology. Technology is a tool which merely amplifies what the professor is teaching and how he is teaching it. Technology will not turn a bad lesson or teacher into a good one. While technology will never replace the need for law professors in the classroom, those who use display technology might replace those who do not because, when used correctly, display technology enhances learning.

I. INTRODUCTION

[T]echnology in the classroom is not only here to stay, its utilization will continue to grow and is likely over time to become the dominant method for delivery of higher education.[1]

—Professor Mary Kay Kane, Former President, AALS

In her inaugural speech as the 2001 president of the Association of American Law Schools ("AALS"), Professor Mary Kay Kane urged that "faculty members and law schools take the opportunity . . . to reflect on our teaching and scholarly missions and how we might or should alter or adapt them to ensure that we will be able to meet the challenges of the

1. Mary Kay Kane, *President's Address: Technology and Faculty Responsibilities*, ASS'N. AM. L. SCH. NEWSL., Apr. 2001 [hereinafter Kane, *Technology*], *available at* http://www.aals.org/pmapr01.html (last visited Mar. 31, 2005) (reporting the key premise of a higher education conference she attended in her capacity as president of the AALS and written in an effort to spur introspection among law faculty). The American Association of Higher Education sponsored the conference, whose focus was the use of technology in the classroom. *Id.* Professor Kane currently is dean of the University of California–Hastings Law School.

new century."[2] She went on to state, "With the new generation of students embracing every aspect of technology and demanding modernized learning environments in their universities . . . the reliance on technology appears inevitable. But what does that mean?"[3] This Article addresses that question by examining the advantages and disadvantages of using display technology in the law school classroom.

Even stone tablets and books were once seen as exciting new instruments for conveying information beyond the oral traditions of the original Socratic dialogues of ancient teachers; but the fear that books would someday replace teachers or reduce students' memory was never realized.[4] Instead, ancient educators not only incorporated the written word into their teachings, but over the centuries have greatly enhanced its use to the benefit of their students. Indeed, books have enabled teachers to focus valuable class time on explanation, analysis, and exploration of issues, rather than on mere information transfer. Just as books have become invaluable tools for good teachers to enhance their students' learning experiences, display technology will also eventually be considered an invaluable educational tool.[5]

The crux of this Article is simple: professors must first master communication in order to be good teachers and using display technology enhances a good teacher's lesson.[6] The essence of teaching is

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2. *Id.*; *see also* Mary Kay Kane, *President's Address: Recommitting to Teaching and Scholarship*, ASS'N AM. L. SCH. NEWSL., Feb. 2001 [hereinafter Kane, *Recommitting*], *available at* http://www.aals.org/pmfeb01.html (last visited Mar. 31, 2005) (commenting that "we need to engage in self-examination so that we can assess how we can bring the technological advances to bear most effectively in ways that enhance what we do in the classroom"). The issue of using technology in the law school classroom was the subject of a special workshop at the 2004 AALS annual meeting. *See generally* AALS Annual Meeting: Workshop on Technology and Pedagogy (Jan. 3, 2004), *at* http://www.aals.org/am2004/technology/technologymaterials.pdf (last visited Mar. 31, 2005).

3. Kane, *Technology*, *supra* note 1.

4. It is interesting to note that written language and books were not met with open arms when they first appeared in education contexts. Socrates, after whom the "Socratic method" of teaching in law schools is named, once criticized written language and the educational reliance on books: "[Written language and books] will produce forgetfulness in the minds of those who learn it, by causing them to neglect their memory, inasmuch as, from their confidence in writing, they will recollect by the external aid of foreign symbols, and not by the internal use of their own faculties." Eric Ashby, *Machines, Understanding, and Learning: Reflections on Technology in Education*, 7 GRADUATE J. 59, 360 (1967) (citing PLATO, THE PHAEDRUS 104 (J. Wright trans., 1921)). Socrates criticized written language as a crutch that dulled the mind, but nevertheless chose to write his great works so that more than those who could hear him could enjoy his work, and also so the work could be saved for posterity. *Id.* Section IV.B.1, *infra*, responds to criticism that display technology dulls the mind with oversimplification.

5. It is hard to imagine a law school class without some sort of book, document, or written text that the professor and students study before class and refer to during class. However, books, like display technology, have their drawbacks when not used properly. For example, if a professor simply read portions of a book aloud in class for the entire class period, it would not only be terribly boring for the class, but also would represent the worst in poor teaching. Accordingly, display technology will only be effective if it is used appropriately and will have ill effects if used inappropriately. *See infra* Section IV.

6. Therese Maynard, *Teaching Professionalism: The Lawyer as a Professional*, 34 GA. L. REV. 895, 912 n.35 (2000) (stating that good communication skills are crucial to effective teaching). "[A]

to convey information and ideas in a way that can be understood by students. Modern students are more accustomed to receiving information visually than students of the past. Legal educators can provide information to their students in an effective and efficient manner by incorporating display technology into their lessons. By conveying information to students in the manner with which they are accustomed, less class time can be spent on information transfer, while more class time can be spent on teaching students how to conduct legal analysis. Including display technology as a communication tool in the modern classroom can make a good teacher a better one.

Use of display technology in the classroom should not be controversial. Use of visual aids in the classroom is as old as the art of teaching itself—"even Socrates drew diagrams in the sand."[7] A law professor who currently uses the simple chalkboard to clarify concepts clearly believes that visual aids enhance communication and, hence, learning. The real issue is *how* display technology should be used.

In Section II, I explain that the use of display technology is growing in society, all levels of education, the practice of law, and the law school classroom.[8] Because of this, law students will come to expect the use of display technology in their law school classrooms.[9] This does not mean that all law professors should give up their lecture notes and chalkboards, but perhaps more law professors should teach in a manner that simulates the way law students receive information in society, at home, and in their pre-law studies—through the combination of visual and verbal communication.[10] In addition, by using display technology, law professors can expose students to a powerful tool that modern trial attorneys use to persuade juries, judges, colleagues, and other legal decision makers in various settings.[11]

In Section III, I explain why and how I have incorporated display technology into my teaching. Research shows that the combination of visual and verbal communication is more effective than verbal

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good teacher both in the classroom and in dealing with students outside the classroom provides a strong role model for her students concerning the importance of communication." *Id.*

7. Vincent Robert Johnson, *Audiovisual Enhancement of Classroom Teaching: A Primer for Law Professors*, 37 J. LEGAL EDUC. 97, 99 n.8 (1987) (citation omitted) [hereinafter V. Johnson, *Audiovisual Enhancement*].

8. *See infra* Section II.B. *See generally* Edutopia, *at* http://www.edutopia.org (last visited Mar. 31, 2005) (describing model teaching practices in public K–12 education).

9. In the future, if display technology is *not* used, law students might expect an explanation as to why it is not being used in their sophisticated (and often very expensive) law school classrooms, especially if it has been pervasive in their K-12 and undergraduate classes. *See infra* Section II.D.

10. *See infra* Section II (citing various sources supporting the notion that with every passing year, law students are becoming more accustomed to receiving complex visual information, not only in education, but in their daily lives).

11. Other legal decision makers in various settings include third-party neutrals in alternative dispute resolution (e.g., mediators, facilitators, arbitrators, and advisory juries), administrative law judges in agency actions, and participants in mergers and acquisitions. The use of display technology by attorneys is as limitless as the practice of law itself because display technology can facilitate the lawyer's effort in presentation, explanation, communication, and persuasion.

communication alone; stimulating the senses of sight and hearing *together* allows for greater access to the brain than hearing alone.[12] I explain how my use of visual aids in teaching has progressed from using the chalkboard alone, to distributing paper handouts,[13] to now incorporating display technology.[14]

Section IV begins with the notion that almost every new technological development in teaching history has received some sort of pedagogical criticism, often based on an initial fear that the teacher will be replaced, as well as a general lack of knowledge of and familiarity with the new technology. However, most of the feared detrimental effects never materialized. Indeed, those concerns often were forgotten and the new technology was absorbed into teaching in various forms. Because history is likely to repeat itself, display technology should not be feared as a modern replacement of the teacher, but instead should be accepted as a natural step in the inevitable evolution of classroom teaching. Like the chalkboard, display technology is just another helpful classroom teaching tool.

Section IV then addresses criticisms of using display technology in the classroom. These criticisms are represented in five questions:

(1) Does display technology oversimplify the classroom experience in order to connect with today's students who, with extensive experience

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12. *See* Fred Galves, *Where the Not-So-Wild Things Are: Computers in the Courtroom, the Federal Rules of Evidence, and the Need for Institutional Reform and More Judicial Acceptance*, 13 HARV. J.L. & TECH. 161, 186 (2000) ("This is true because verbal conversation is not the primary method by which human beings gather information—sight is." (citation omitted)); *see also* William C. Costopoulos, Commentary, *Persuasion in the Courtroom*, 10 DUQ. L. REV. 384, 406 (1972) (presenting study results finding that humans accomplish 85% of their learning through visual sight, while hearing and all other senses account for only 10% and 5%, respectively); Galves, *supra*, at 190–91 (explaining that the average person absorbs and more clearly understands information when it is perceived with two senses instead of only one); Charles C. Schroeder, *New Students—New Learning Styles*, CHANGE, Sept.–Oct. 1993, at 21, 24 (stating that 75% of the public prefers to learn and solve problems through sensory or concrete learning devices, such as visual simulations).

13. Although I periodically distribute elaborate flow charts, I currently do not distribute hard copies of my computer images to the students because I believe there is a great learning benefit when students are required to read and interpret information and then write it out for themselves, rather than just passively receiving information already written in a handout. *See* Harry Kay, *Learning and Retaining Verbal Material*, 46 BRIT. J. PSYCHOL. 81, 81–100 (1955) (finding that a student is more likely to remember what she records than assertions produced by others); *see also* Kenneth A. Kiewra, *Notetaking and Review: The Research and Its Implications*, 16 INSTRUCTIONAL SCI. 233, 234 (1987) (finding that writing down concepts through notetaking "increases attention during the lecture and facilitates encoding of lecture ideas into long term memory"); Richard L. Roe, *Valuing Student Speech: The Work of the Schools as Conceptual Development*, 79 CAL. L. REV. 1269, 1299 (1991) ("Students learn by working with ideas, attempting to fit them into their cognitive structures, and reformulating those structures as necessary."). Also, using display technology instead of handouts reduces paper usage, thereby reducing paper costs and saving trees. Despite my rather illegible chalkboard writing, I still use the chalkboard for spontaneity and added flexibility, such as when I want a particular diagram or important text passage to remain up on the board for added emphasis or frequent referral. For a complete discussion, see *infra* Section III. Also, for a further discussion on the use of providing printed copies of computer images as handouts, see *infra* Section IV.B.5.

14. I typically use Microsoft PowerPoint and a computer projector to display images on a screen in the classroom. Section III, *infra*, also discusses hardware and software options for display technology.

in receiving visual stimuli, have suffered an unfortunate decrease in their attention spans and their ability to think critically?

(2) Does display technology stifle intellectual spontaneity by shutting down a student's, and even the professor's, desire to explore unpredictable academic tangents during class?

(3) Does class become a showcase for technology instead of a real learning experience when a professor uses display technology?

(4) Do the classroom dynamics of a good Socratic give-and-take dialogue suffer due to the professor's inflexible class agenda where the expected "answer" is already displayed, or just about to appear, on the screen?

(5) Is using display technology simply "electronic spoon-feeding" where the professor is reduced to a boring "information-giver," shoveling out legal information through slides, while the students become inactive "information-receivers" who copy the images without ingesting the material or developing analytical skills in the process?

In addition to presenting responses to these questions, I will discuss ways either to avoid (or at least to ameliorate) such problems.

Finally, I conclude by advocating that display technology in the classroom should not be feared, but be embraced as a useful classroom tool. As a classroom tool, display technology cannot, by itself, turn a professor into either a particularly *good* professor or a particularly *bad* professor. Thus, similar to a microphone, display technology simply amplifies a professor's preexisting teaching skills and personality. The potential pitfalls addressed in Section IV are, in reality, all functions of ineffective teaching techniques rather than some inherent pedagogical defect of display technology. As such, display technology simply conveys in a clear manner whatever a professor is or is not doing well in the classroom; but display technology is not responsible for the pedagogy, the professor is. Hence, video will not kill the radio star.

II. VISUALLY ENHANCED COMMUNICATION IN SOCIETY, EDUCATION, THE PRACTICE OF LAW, AND THE LAW SCHOOL CLASSROOM

> *Just as the Industrial Revolution dramatically expanded the strength of a man's muscles and the reach of his hand, so the smart-machine revolution will magnify the power of his brain. But unlike the Industrial Revolution, which depended on finite resources such as iron and oil, the new information age will be fired by a seemingly limitless resource—the inexhaustible supply of knowledge itself.* [15]

15. MARK R. ARKFELD, THE DIGITAL PRACTICE OF LAW 1 (5th ed., Morris Publ'g 2001) (quoting unknown author). Despite the sexism of the unknown author (who seems to ignore the place of women in history and, apparently, in the future as well), the author captures the power and promise of the information age which, in historical time, we have just begun living.

A lot of the older ideas about education . . . now [are] possible with technology because technology brings the system back to a personal level, which allows for more project learning.[16]
—George Lucas, creator of the Star Wars *movies*

A. Visually Enhanced Communication in Society

Today, information permeates society as access to it is made easier through the Internet, television, and print.[17] Visual imagery accompanies much of the information people seek or to which they are exposed. From MTV to the boardroom, television news reports to lifelike video games, live Web cameras to flashy billboard advertisements, Americans receive communication through an unprecedented amount of high-tech visual imagery.[18] Young adults, and especially teenagers, whom law schools will draw as future law students, were raised within this age of

16. Interview by Alex Chadwick with George Lucas, Chairman, George Lucas Educational Foundation (May 15, 2002), *available at* http://www.npr.org/news/specials/starwars. George Lucas founded the George Lucas Educational Foundation, which funds educational technology projects in public schools. For more information, see http://www.glef.org (last visited June 5, 2005).

17. *See* Wendy R. Leibowitz, *Electronic Lawyering on the Rise*, NAT'L L.J., Sept. 2, 1996, at B9 (comparing the Internet to the world's largest library). Many other authors also have analogized the Internet to a large, worldwide library. *See, e.g.*, *Assessing the Internet*, IRISH TIMES, Dec. 3, 1997, at 20; *Half Australian Small-Medium Business Online*, AAP NEWSFEED, Dec. 14, 1999; Barbara R. Hume, *Getting Tech Support on the Net*, LAN TIMES, Oct. 9, 1995, at 47; Paul Kyber, *Walking to Your Home Computer for Answer Sure Beats Library Trip*, RICH. TIMES DISPATCH, Aug. 21, 1997, at D24.

18. S*ee* William McDonald, *Dazzled or Dazed? The Wide Impact of Special Effects*, N.Y. TIMES, May 3, 1998, § 2A, at 1 (explaining that modern citizens are exposed to complex visual stimuli like never before); *see also* Paul Farhi, *Blanketing the D.C. Area with Snow Coverage*, WASH. POST, Jan. 26, 2000, at C1 (proposing that visual technologies such as 3-D flybys and map-in-motion satellite shots have tremendously improved TV weathercasting and audience understanding); John Gaudiosi, *Gamers Set for Holiday Score*, HOLLYWOOD REP., Nov. 20, 2001 (explaining that new video games "feature[] better-than-cinematic visuals and new surround-sound technology to deliver a breathtaking arcade experience"); Justina Hart, *This Vision Thing*, TIMES EDUC. SUPP. TEACHER, June 7, 2002, at 15 (stating that "[a]nyone from a television-deprived household appears narrow-minded to their MTV and Sky-savvy counterparts, as though they inhabit a black and white universe"); Robert L. Lindstrom, *Visual Communications @ Work*, AV VIDEO MULTIMEDIA PRODUCER, July 1, 2000, special advertising section ("At some point, the ability to communicate with pictures and sounds will be as critical to business success as reading and writing skills are today."); Jeannine Stein, *Signs of the Times: Advertisers Envision a Los Angeles Sprinkled with High-Tech Billboards that Move, Interact, and Adapt*, L.A. TIMES, Sept. 6, 2001, at E1 (stating that "technology [is] making outdoor advertising more eye-grabbing, more interactive, smarter and definitely more in your face"). According to Microsoft, there are now twenty-two million copies of PowerPoint installed on computers in the United States, and more than seventy million worldwide. Lindstrom, *supra*. *See also* Jon Ralston, *State of State Will Resonate*, LAS VEGAS REV.-J., Jan. 17, 1999, at 23A (explaining that the then newly elected governor of Nevada, Kenny Guinn, would use visual aids in his State of the State address); Peter Varhol, *Are You a "Great Communicator"?*, ELEC. DESIGN, Jan. 22, 2001, at 132, 134 (noting that "[s]oftware technology keeps raising the bar on the definition of an acceptable presentation"); Stephen H. Wildstrom, *Big-Screen Just Got a Lot Better*, BUS. WK., Feb. 4, 2002, at 16 (stating that the video projector has "become a standard tool in the kit of ordinary folks who give presentations"). Consider also the unprecedented visual press coverage of the second Gulf War. *See* Tim Goodman, *War's End Marks Cable News' Retreat*, S.F. CHRON., Apr. 17, 2003, at E1 (calling the war in Iraq "a visual war like no other"). "[I]n Gulf War II, new technology allowed the onslaught of tanks to be seen rumbling, live, across a desert. Reporters with videophones were everywhere. Guns were going off, the night sky was constantly orange and the battlefield was large, the story mobile." *Id.*

pervasive visual communication.[19] Modern students will expect their educators to understand the environment from which the students come.

B. Visually Enhanced Communication in Education

The increased reliance on visually based communication has serious implications for academia. Educators must consider the fact that students are accustomed to receiving information through a combination of sound and image. Indeed, it has been estimated that upon graduation, the average high school student has completed 11,000 hours of classroom education compared to 15,000 hours of television viewing.[20] While this statistic would probably be considered unfortunate by most, it nonetheless describes many modern students and highlights the generational gap between students and most professors.[21]

An important question for academia is this: to what extent has the deluge of visual communication in modern society made teaching with display technology conducive to learning?[22] It is clear that people

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19. *See* NTIA & ECON. & STAT. ADMIN., A NATION ONLINE: HOW AMERICANS ARE EXPANDING THEIR USE OF THE INTERNET 42 (Feb. 2002), *available at* http://www.ntia.doc.gov/ntiahome/dn/anationonline2.pdf (finding that "more than any other age group, these younger age groups use computers and the Internet widely for many of their daily activities"). In September 2001, the Department of Commerce surveyed over 57,000 households and 137,000 individuals across the nation and found that households with children under the age of eighteen are far more likely to have computers than households without children: 70.1%, compared to 58.8%. *Id.* at 3, 42. In the past four years, Internet use among 10- to 13-year-olds has risen from 39.2% to 65.4%, and among 14- to 17-year-olds it has risen from 51.2% to 75.6%. *Id.* at 43. *See also* William Wesley Patton, *Opening Students' Eyes: Visual Learning Theory in the Socratic Classroom*, 15 L. & PSYCHOL. REV. 1, 11 n.27 (1991) (noting that "[o]ur students are bombarded with visual icons wherever they go and are thus primed to consider visual organizers as analytic devices"); Bettina Lankard Brown, *New Learning Strategies for Generation X*, ERIC DIGEST NO. 184 (1997), *at* http://www.ericdigests.org/1998-1/x.htm (last visited Mar. 31, 2005) (showing that Generation X-ers are technologically literate).

20. R. Dennis Donoghue, *Demonstrative Exhibits: A Key to Effective Jury Presentations*, *in* PATENT LITIGATION 1992, at 369, 371 (1992), WL 349 PLI/Pat 369.

21. *See generally* Beloit College's Class of 2002 Mindset List, *at* http://www.beloit.edu/~pubaff/mindset/2002.html (last visited Mar. 31, 2005). Every year, Beloit College publishes "The Mindset List" to emphasize that professors' cultural references are often far different than those of the younger students taking their classes. Although the list applies to college freshman born in 1980, rather than first-year law students who are at least four years older, the overall point is still applicable. The list sets forth fifty examples of cultural references that professors know but their students probably do not, such as the statement "You sound like a broken record," which means nothing to students, as they have never owned a record player; moreover, most have never seen a TV set with thirteen manual channels, nor have they ever seen a black-and-white TV; Jay Leno has always been the host of *The Tonight Show*; and there has always been MTV. *Id.* Comparing older versions of Beloit's Mindset List with more recent ones shows how rapidly cultural references change. *See id.*

22. *See* Patrick Groff, *Auditory Versus Visual Styles of Learning to Read: A False Dichotomy*, NAT'L RIGHT TO READ FOUND., *at* http://www.nrrf.org/003_auditory_vs_visual.html (last visited Mar. 31, 2005) (stating that "multisensory teaching (combining visual, auditory, and kinesthetic learning) produces the greatest growth in children's reading competency"); *see also* Steven I. Friedland, *How We Teach: A Survey of Teaching Techniques in American Law Schools*, 20 SEATTLE U. L. REV. 1, 35 n.91 (1996) (surmising that "[v]isual learning techniques provide a pertinent illustration of techniques that . . . may augment and reinforce the learning of many students weaned on television and movies"). The success of educational television shows the effectiveness of visual learning techniques. For example, watching Discovery Channel, History Channel, or The Learning Channel for entertainment

remember more of what they see than what they hear.[23] Therefore, people retain information communicated through sight and sound better than information conveyed through sound alone.[24] Society recognizes this, as entertainers, news providers, advertisers, and businesspeople increasingly use sight with sound to better communicate with their audiences.[25] Perhaps legal educators should do so as well.

Law professors as a group use display technology less frequently than do undergraduate and other graduate-level professors.[26] For

is far more likely to inspire people to learn about a particular topic than would reading a textbook or encyclopedia. This is not to suggest that reading a book is no longer important or relevant, but instead is simply an acknowledgment that law students, like it or not, are receiving more information visually than ever before. Visual learning begins very early for most children and often continues into their higher education. *See* Aletha C. Huston & John C. Wright, *Television and the Informational and Educational Needs of Children,* 557 ANNALS AM. ACAD. POL. & SOC. SCI. 9, 10 (1998) (describing how *Sesame Street* teaches children "letters, numbers, concepts, science, and information of all kinds" through formats that appeal to them, such as animation). "Some educators consider the visual character of television a distinct advantage because of young children's tendency to give visually presented information priority over verbally presented information . . . . Because children tend to learn from concrete, visual presentations, television is well suited to their learning styles." *Id.* at 16. According to one study, children who frequently watched *Sesame Street* and other educational programs at age five received higher high school grades in math, science, and English than children who viewed infrequently. *Id.* at 13. *But cf.* Jianxia Du & James D. Anderson, *Technology and Quality of Education: Does Technology Help Low-Income and Minority Students in Their Academic Achievements?*, 2003 U. ILL. J.L. TECH. & POL'Y 1 (outlining a study which shows that access to technology alone cannot narrow the educational gap between different socioeconomic groups).

23. *See supra* note 13 and accompanying text.

24. *Id*.

25. *See supra* note 19 and accompanying text.

26. *See* Shelley Ross Saxer, *One Professor's Approach To Increasing Technology Use in Legal Education*, 6 RICH. J.L. & TECH. 21, ¶ 1 (Winter 1999–2000), *at* http://law.richmond.edu/jolt/v6i4/article4.html (noting that "[u]ndergraduate professors in business, science, religion, and other subjects commonly use presentation software to illustrate substantive concepts with formulas, maps, and text"); *see also* Paul F. Teich, *How Effective Is Computer-Assisted Instruction? An Evaluation for Legal Educators*, 41 J. LEGAL EDUC. 489, 489 (1991) (noting that "[l]aw schools have been much slower than other professional and graduate schools to adopt computer-augmented teaching methods"); Educational Technology Services Homepage, Univ. of California–Berkeley, *at* http://ets.berkeley.edu (last visited Mar. 31, 2005) (explaining the wide variety of services provided by UC–Berkeley's Educational Technology Services, including classroom technology, video and broadcasting, webcasting, and videoconferencing); Instructional Computing Group Homepage, Harvard Univ., *at* http://icg.harvard.edu (last visited Mar. 31, 2005) (describing that Harvard's Instructional Computing Group ("ICG") provides technological resources to Harvard faculty, including assistance in teaching with technology); Stanford Learning Lab Homepage, *at* http://sll.stanford.edu/projects/index.html (last visited Mar. 31, 2005) (describing how professors at Stanford are using technology in their undergraduate courses, from the humanities to biology); Teaching @ the UW, Univ. of Wash., *at* http://www.washington.edu/teaching (last visited Mar. 31, 2005) (explaining the various technological services offered by the University of Washington, including one-on-one assistance with PowerPoint presentations, Web site development, image scanning, and multimedia consulting). Many undergraduate professors at Harvard have utilized ICG's services; during 2001–2002, about five hundred courses per term developed individual Web sites. About the Instructional Computing Group, Harvard Univ., *at* http://icg.harvard.edu/about_icg/ (last visited Mar. 31, 2005); Steven F. Jackson, *The Use of PowerPoint in Teaching Comparative Politics*, TECH. SOURCE (May 1997) (on file with the *Journal of Law, Technology & Policy*) (reporting student feedback and the benefits of using PowerPoint to teach two comparative politics classes at Indiana University of Pennsylvania ("IUP")). IUP reports substantial increases in student satisfaction and enrollment, as well as increased perception, retention, grasp of material, organization, and enjoyment. *Id*. IUP explains that the most important conclusion gathered from the survey may be that 92% of the students surveyed said that PowerPoint presentations made the class sessions more interesting. *Id*.

example, medical schools regularly use computer animations, simulations, and videos.[27] Top business schools require their students to use the same display technology currently used in the real world.[28] While some legal educators incorporate visual aids into their lectures, most do not, and even fewer use display technology.[29] This represents a failure on the part of legal academia, in general, to consider the visual and technological backgrounds of modern law students.[30]

Also, IUP found that the PowerPoint presentations helped students take notes and understand the material. *Id*. One of the overwhelmingly positive student reactions included the following: "I could concentrate on the discussion better and organize my notes more efficiently with the presentations." *Id*. For a complete discussion on the history of legal education and introduction of technology in legal education, see Stephen M. Johnson, *www.lawschool.edu: Legal Education in the Digital Age*, 2000 WIS. L. REV. 85, 86–92 [hereinafter S. Johnson, *www.lawschool.edu*].

27. *See* Jeremy P.T. Ward et al., *Communication and Information Technology in Medical Education*, THE LANCET, Mar. 10, 2001, at 792 (stating that "[w]ithin less than two student generations, communication and information technology has been repositioned as an integral component of the medical school environment"); *see also* Teich, *supra* note 26, at 489 (stating that other graduate schools besides law have been quicker to adopt computer-aided teaching methods).

28. *See* Galves, *supra* note 12, at 276 n.369 (describing how business schools teach students the technology they will need in their future jobs); s*ee, e.g.,* The Alfred West Jr. Learning Lab Homepage, The Wharton Sch. at the Univ. of Pa., *at* http://www.wharton.upenn.edu/learning (last visited Mar. 31, 2005) (describing how technology utilized in the learning lab allows students to engage in real-world exercises); Our Vision of an IT Environment, Info. Tech. Group, Harvard Bus. Sch., *at* http://www.hbs.edu/it/vision/environment.html (last visited Mar. 31, 2005) (explaining that the Harvard Business School's ("HBS") "technology-enabled environment" helps both students and faculty at HBS build information expertise); Strategic Uses of Information Technology, Stanford Graduate Sch. of Bus., *at* http://www.gsb.stanford.edu/exed/suit (last visited Mar. 31, 2005) (recognizing that since "[r]ecent developments in information technology have transformed the way organizations conduct business," Stanford Business School offers a special program—Strategic Uses of Information Technology—designed to teach students how to utilize technology in business environments).

29. *See* Steve Sheppard, *Casebooks, Commentaries, and Curmudgeons: An Introductory History of Law in the Lecture Hall*, 82 IOWA L. REV. 547, 636 (1997) (noting that, according to a 1995 survey, 60% of professors use no audio–visual aids); *see also* James Eagar, *The Right Tool for the Job: The Effective Use of Pedagogical Methods in Legal Education,* 32 GONZ. L. REV. 389, 410 (1996–1997) (noting that although visual aids are used extensively in the practice of law, few law professors use visual aids in the classroom except for the chalkboard); Nira Hativa, *Teaching Large Law Classes Well: An Outsider's View*, 50 J. LEGAL EDUC. 95, 102 (2000) (observing that law professors rarely used chalkboards, let alone any audio–visuals or computers); S. Johnson, *www.lawschool.edu*, *supra* note 26, at 90 (noting that technology is beginning to "play a more central role in legal education").

30. *See* V. Johnson, *Audiovisual Enhancement*, *supra* note 7, at 98 (noting that most law students "are products of the electronic media generation, having been nurtured on ever more pervasive forms of audio and video media, at home, at play, and in earlier schooling. From this common experience, legal educators should take their cue." (citation omitted)); *see also* Richard A. Matasar & Rosemary Shields*, Electronic Law Students: Repercussions on Legal Education*, 29 VAL. U. L. Rev. 909, 910 (1995) (recognizing that "[s]tudents brought up with . . . technology will need technology to learn"). Perhaps most law professors' reluctance to use display technology in the classroom can be traced to the fact that they were not themselves taught with displays. These professors might reason that since their former professors—their own pedagogical role models—were effective in the classroom without technology, they can also be similarly effective.

C. Visually Enhanced Communication in the Practice of Law

1. Legal Practitioners: Well Ahead of Legal Academia

Along with society and educators in general, those in the practice of law are also adapting to a more visually oriented world by using display technology. This adaptation is not so much of a technological revolution in the legal field as it is the continued natural development of a long history of using visual aids at trial.[31] Long before computers, trial attorneys were using visual aids such as blowups on poster board, photographs, diagrams, lists of elements, and time lines as exhibits.[32] Although it perhaps has taken longer for attorneys than for other professionals to use computer-generated images,[33] lawyers have begun to

31. *See* Jennifer L. Mnookin, *The Image of Truth: Photographic Evidence and the Power of Analogy*, 10 YALE J.L. & HUMAN. 1, 9–14 (1998) (explaining that attorneys began using photographs in the courtroom in the mid-1800s; by the end of the nineteenth century, the photograph "had become a significant evidentiary tool"); *see also* ROBERT E. KEETON, TRIAL TACTICS AND METHODS 81 (Little, Brown, and Co. 1973) (1954) (explaining that even non-computerized visual aids—such as drawings on paper and blackboards—allow the witness to "more accurately convey to the jury the idea that is in his own mind"); *Tête-à-tête on Techno-trials*, A.B.A. J., June 1999, at 78 [hereinafter *Tête-à-tête*] (interviewing Frederic I. Lederer, Professor of Law, College of William & Mary, who notes that computer-generated exhibits are "simply an extension of a trial lawyer's traditional way of presenting evidence or improving the presentation of a case or the administration of justice").

32. *See* KEETON, *supra* note 31, at 81; *see also* State v. Knight, 43 Me. 11, 78 (1857) (explaining meaning through the use of witness diagrams); William H. Ginsburg, *Final Argument: The Closing Effort*, *in* WINNING STRATEGIES AND TECHNIQUES FOR CIVIL LITIGATION 221 (James E. Lyons ed., 1992) (explaining that "professional blowups of charts . . . [,] pictures . . . [,] films, slides, and the like" help focus the jury's attention); Galves, *supra* note 12, at 179 (citing current uses of visual aids in court); Frederic I. Lederer, *An Environment of Change: The Effect of Courtroom Technologies On and In Appellate Proceedings and Courtrooms*, 2 J. APP. PRAC. & PROCESS 251, 259, 266 (2000) (implying that the combination of both oral and visual matter helps jurors better understand and remember content, citing a study which suggested that "cases involving video records were more likely to be affirmed than those with traditional transcripts"). *See generally* Jane A. Kalinski, Note, *Jurors at the Movies: Day-in-the-Life Videos as Effective Evidentiary Tool or Unfairly Prejudicial Device?*, 27 SUFFOLK U. L. REV. 789, 792 n.18 (1993) (discussing courts that have allowed demonstrative evidence such as photographs, x-rays, anatomical models, blueprints, charts, and graphs to be admitted into evidence); Symposium, *Panel Three: Demonstration and Discussion of Technological Advances in the Courtroom*, 68 IND. L.J. 1081, 1082 (1993) [hereinafter Symposium, *Panel Three*] (noting the statistical and practical advantages of using visual aids in the courtroom: "Visual aids allow you to logically convey your client's story to the jury. You may hone in on pertinent facts relative to your case in ways that will dramatically increase understanding and retention during deliberation—days, weeks, or months later.").

33. For example, physicians and surgeons have come to rely on visual imaging. *See, e.g.*, Ihsan Dogramaci, *Science and Civilization: Tasks for the Next Millenium*, 23:2 FLETCHER F. WORLD AFF. 171, 178–79 (Fall 1999) (explaining that image-processing techniques are being used in areas of medicine like neurosurgery, where a mini-robot discovers and removes unwanted growth); Gary Goettling, *The Art and Science of Healing*, GA. TECH. ALUMNI MAG., Winter 1998, *available at* http://gtalumni.org/StayInformed/magazine/win98/artheal.html (last visited June 6, 2005) (discussing how biomedical engineering utilizes a variety of computer-imaging techniques such as computed tomography ("CT") and magnetic resonance imaging ("MRI")). Computer-imaging techniques, like CT and MRI, are critical because they allow physicians to accurately visualize a cross-section or a three-dimensional image of internal bodily organs and structures. *Id*.

take full advantage of the power of display technology in the courtroom.[34]

Attorneys use display technology at trial to explain clearly and simply their case theories and versions of the facts to juries, judges, and colleagues. In doing so, attorneys are able to persuade by helping their audience comprehend and retain information[35] of the attorney's choice.[36] Therefore, the legal profession is already adapting to a high-tech visual world with computer-display technology.[37]

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34. For a complete discussion of computerized display technology in the courtroom, see Galves, *supra* note 12, at 177–261; Stephen G. Norten, *The Electronic Courtroom Revolution: The Right Stuff*, 26 VT. B.J., Mar. 2000, at 47–48 (explaining the courtroom advantages of PowerPoint).

> PowerPoint can bracket this incredibly deft manipulation and publication of the exhibits during opening and closing. During the evidence phase itself, you can instantly confront the prevaricating witness or dissembling expert (as occurred during the recent Microsoft trial)—not with cumbersome "didn't you tell me then" lectures, repeated strolls to the witness stand, flapping deposition transcripts, and scintillating "page and line" exchanges—but with in-your-face images of the actual deposition testimony or the smoking-gun exhibit itself.

Norten, *supra*, at 47–48. *See also* Fredric I. Lederer, *Courtroom Practice in the 21st Century*, TRIAL, July 1999, at 38 [hereinafter Lederer, *Courtroom Practice*] (outlining a "laboratory trial" conducted annually by the Courtroom 21 Project at William and Mary Law School, a jury trial "designed to determine how a judge, counsel, and jury handle the technologies available in the project's . . . [c]ourtroom").

> Counsel will argue from a rotatable control podium, complete with a built-in liquid crystal display ("LCD") monitor, that includes all the technology a lawyer might use to present the case. As the attorneys argue, they may seek permission to display key aspects of the brief on the judge's monitor. The judge may respond by displaying on counsel's monitor material from either the defense or plaintiff's brief. The judge may also display legal authority from LEXIS or WESTLAW, CD-ROM's, or the Internet. Thus, traditional legal argument becomes visually supported argument.
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> Voir dire begins. The judge or counsel goes over the list of witnesses. As each name is mentioned, the jury sees a photograph of the witness, displayed either as a computer "slide show" or on monitors connected to the courtroom's document television camera. Visually augmented voir dire diminishes the possibility of a juror finding out during trial that he or she knows the witness.

Id. at 38–39.

35. *See* Galves, *supra* note 12, at 189.

> The same information perceived visually is more easily believed and has a greater impact than when gathered from an indirect, second-hand source—the words of another—because visual information is direct (an actual image) instead of indirect and abstract (words (step #1) used to create a mental image (step #2) in the mind of the jury).

Id.; *see also* Jeffrey R. Boyll, *Psychological, Cognitive, Personality and Interpersonal Factors in Jury Verdicts*, 15 LAW & PSYCHOL. REV. 163, 173 (1991) (noting that "as much as two-thirds of what is heard may be immediately forgotten" and that one of the consequences of this poor memory retention may be that a juror might associate some facts or witness from one side of the case with the wrong party).

36. *See* Symposium, *Panel Three*, *supra* note 32, at 1085 (quoting Robert F. Ruyak: "My concept is that up front you have to explain all of the mechanical devices, the jargon, and the characters in the litigation. You do this by taking a novel and reducing it to a screen play—a 500-page novel to a two-hour screen play."). The most successful way to communicate complex information is visually. *Id*.; *see also* Mark Kolber, *Just Picture It: Advocacy and Computer-Generated Presentations*, COLO. LAW., Dec. 1997, at 29 (stating that while attorneys are usually trying to reach the jury through their ears, "most of what people learn is through their eyes"); *cf*. Paul J. Feltovich et al., *The Reductive Bias and the Crisis of Text (in the Law)*, 6 J. CONTEMP. LEGAL ISSUES 187, 187–89 (1995) (arguing that when particular ideas or concepts are put into words, the audience reconstitutes the words back into concepts in their minds, which can lead to differing individual interpretations).

37. *See infra* note 47 (discussing the use of technology in the courtroom).

2. Law Professors Can Learn from Trial Attorneys

Law professors can learn some important classroom presentation and teaching lessons from trial attorneys. Since trial attorneys essentially teach jurors about their version of the case,[38] professors should recognize that teaching techniques which result in better comprehension and retention for jurors in the courtroom can result in better comprehension and retention for law students in the classroom. Although law students obviously are different from jurors,[39] there is an overlap between them in terms of the need to understand and retain complex legal and factual information.[40]

Trial attorneys who use visual aids know that the use of display technology is an integral part of persuasive advocacy.[41] Jurors not only forget nearly two-thirds of what they hear,[42] many misunderstand what they hear.[43] Presenting information to jurors both orally and visually results in greater retention[44] and understanding[45] than if the information

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38. *See* Ronald J. Rychlak & Claire L. Rychlak, *Real and Demonstrative Evidence Away from Trial,* 17 AM. J. TRIAL ADVOC. 509, 509–10 (1993) (observing that trial attorneys are like teachers because jurors are "taught" by lawyers about a case and by the judge about what the law is); *see also* Symposium, *Panel Three*, *supra* note 32, at 1082 (explaining that using visual aids helps trial attorneys "logically convey [their] client's story to the jury").

39. Law students have to be taught (become intellectually engaged with) the law, legal analysis, and legal skills *actively*, while jurors are simply "taught" (presented with) competing versions of the facts *passively*. Indeed, jurors generally are not allowed to ask questions of witnesses during trial. *See* Douglas G. Smith, *Structural and Functional Aspects of the Jury: Comparative Analysis and Proposals for Reform*, 48 ALA. L. REV. 441, 553 (1997) (explaining that, in American courts, jury questioning of witnesses is typically not allowed). Jurors are not supposed to determine the law at all, only find facts, because making legal determinations is supposed to be an exclusively judicial function. *See, e.g.,* Hughes v. Quarve & Anderson Co., 338 N.W.2d 422, 425 (Minn. 1983) ("The court, not the jury, determines the law of a case, and the jury decides the factual issues based on the law submitted to them.").

40. If using display technology in a courtroom works better than words alone to help jurors better understand, recall, and apply complex legal and factual information when they both hear and see it as they learn it, then there is ample reason to believe display technology would better help law students understand, recall, and apply complex legal and factual information. In many respects, law students are just as unfamiliar with the law and complex cases as a typical lay juror, especially when law students begin law school and are desperately trying to understand, retain, and apply vast amounts of complicated information. Law students, like jurors, "deliberate" in class and in their study groups throughout their legal education. Although lawyers are not trying to make legal professionals out of jurors the way that law professors are trying to do with law students, there is a similar learning point and teaching goal that is present for both law students and for jurors that law professors ought to acknowledge.

41. *See generally* FRANK D. ROTHSCHILD ET AL., POWERPOINT FOR LITIGATORS: HOW TO CREATE DEMONSTRATIVE EXHIBITS AND ILLUSTRATIVE AIDS FOR TRIAL, MEDIATION, AND ARBITRATION (Deanne C. Siemer ed., 1999). The use of display technology in court continues to grow, as seen from the publication of this kind of book, with the incorporation of PowerPoint in Trial Advocacy classes in law schools and the training of attorneys in the use of PowerPoint.

42. *See* Boyll, *supra* note 35, at 173 (noting a study where subjects were told a short story involving a crime which contained twenty-four "bits" of information and the subjects immediately forgot approximately two-thirds of the bits).

43. *Id.* at 171 ("[M]any jurors may fail to understand the most basic concepts and issues.").

44. *See* Kalinski, *supra* note 33, at 792 ("[A]fter three hours, participants [in a study] retained 20% more information introduced in a combination visual–oral presentation than a purely oral presentation . . . . Moreover, after seventy-two hours, participants remembered 500% more of a

is conveyed only orally. Trial attorneys who use visual aids understand that display technology aids juries by making otherwise boring, complex information: (1) *imaginable,* by prompting sensory imagery; (2) *proximate*, by making it close to what the jury understands; and (3) *memorable,* by enhancing the jury's ability to recall critical information during deliberations.[46] Accordingly, many trial attorneys use display technology successfully every day[47] and the trend is for that usage to keep growing.[48]

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combination visual–oral demonstration than a purely oral demonstration."); *see also* Windle Turley, *Effective Use of Demonstrative Evidence: Capturing Attention and Clarifying Issues*, TRIAL, Sept. 1989, at 62 (citing a study showing that jurors given visual presentations retained 100% more information than those given oral presentations alone).

45. *See* Galves, *supra* note 12, at 189 (noting that attorneys use visual aids in order to make information more familiar and to reduce misunderstanding); Lederer, *Courtroom Practice*, *supra* note 34, at 40 (purporting that "[m]any people are visual learners, absorbing best the information that they see rather than hear" and that visual aids help the trier of fact to understand and remember witness testimony); Symposium, *Panel Three*, *supra* note 32, at 1082 ("Research has shown that the use of visual aids with an oral presentation can aid comprehension, minimize misunderstanding and increase retention level by as much as sixty-five percent."). Computer-generated exhibits increase the amount of information that is absorbed by a judge or jury, thereby enabling them to understand complex concepts more clearly because the information is perceived by sight and hearing, instead of hearing alone. Galves, *supra* note 12, at 190–91.

46. *See* Galves, *supra* note 12, at 188–89.

47. *See* Dennis M. Kennedy, *Bringing Presentation Technology into the Courtroom*, RES GESTAE, July 1999, at 11–12; *see also* Debra Baker, *Wired for Insight*, A.B.A. J., July 2000, at 95. "Wired for Insight" reported on a mock trial held in Spring 2000 at the National Judicial College on the campus of the University of Nevada and sponsored by the ABA Tort and Insurance Practice Section:

> Jurors used handheld devices to register their reactions to the arguments and evidence the lawyers presented. A computer program then translated those responses into a line graph that appeared on a video monitor in real time. The lawyers could then evaluate their level of persuasiveness as they presented each aspect of their cases. The jurors also used the devices to vote for the plaintiff or defendant after key portions of the trial—voir dire, opening statements, the plaintiff's case, the defendant's case and closing arguments. Scores appeared on the monitor, showing the lawyers the points in the case where they won or lost jurors.

Baker, *supra*, at 95. *See also* Kate Marquess, *Try All Trial Styles: Trial Lawyers Recommend a Balance Between Technology and Emotion,* 86 A.B.A. J., July 2000, at 91 (describing a second mock trial held in Spring 2000 at the National Judicial College on the campus of the University of Nevada, which was a study in contrasting courtroom styles, with one lawyer utilizing technology and the other not). Plaintiff's lawyer Joseph Cotchett implored the jury to find for his client, appealing to their emotions and patriotism, while defense attorney Fred Bartlit, Jr. "countered Crochett's emotional closing argument with a dispassionate presentation . . . with Microsoft PowerPoint software." *Id.* "'In today's modern age, you must, you *must* use technology,' Cotchett said. 'You're dealing with very smart jurors. They have tremendous access to information . . . .'" *Id*. *See also* Norten, *supra* note 34, at 47. Norten discussed one of his experiences using PowerPoint during a seminar:

> Burlington, 1998: I use PowerPoint for my portion of a VBA seminar on *Daubert v. Merrell Dow*, drawing on only a fraction of the awesome power of this simple tool. Judge Matthew Katz approaches me afterward and informs me of his hope and expectation that I will use PowerPoint in my next closing argument.

Id. at 47.

48. *See* Hope Viner Samborn, *Turning the Page on Paper: As Electronic Devices and Case Management Software Make Their Mark on the Profession, Lawyers Are Discovering that Technology Makes a Welcome Partner*, A.B.A. J., Mar. 2000, at 80, 81 (noting that "more trial attorneys are integrating technology into their courtroom presentations and strategies, especially since many courts already have the technology in place"); *see also* Evelyn D. Kousoubris, *Computer Animation: Creativity in the Courtroom,* 14 TEMP. ENVTL. L. & TECH. J. 257, 258–59 (1995) (noting that in the

Since lawyers are increasingly using display technology in courtrooms to communicate efficiently and effectively with jurors, law professors ought to take note of it because they also have a similar goal of communicating with law students. Law students cannot learn from or be intellectually challenged by a professor if they cannot first understand the professor. Although attorneys and jurors, on the one hand, and law professors and law students, on the other, engage each other in different ways and have some different objectives, they still share many of the same pedagogical concerns—communication, organization, understanding, retention, and correct application of legal concepts to complicated facts. It is therefore helpful for law professors to consider these effective communication tools increasingly being used in the legal profession—the very profession for which they are training and preparing their students to enter.[49]

D. Visually Enhanced Communication in the Law School Classroom

Despite the increased use of visual communication in society, in education, and among legal practitioners, the typical law school lesson largely resembles the law school lesson of over one hundred years ago: a law professor stands in the front of the class, perhaps at a podium, presenting to students in some mixture of lecture, Socratic dialogue, and class discussion, all the while communicating almost exclusively through speech.[50] As "Professor Kingsfield," the infamous contracts professor in *The Paper Chase*, reminded us over thirty years ago, the purpose of this arduous verbal question-and-answer process in law school is to turn a

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1970s, with limited technology, computer use in the courtroom was only an idea, and that by the 1990s, computer use in the courtroom had become common).

49. *See* SECTION OF LEGAL EDUC. AND ADMISSIONS TO THE BAR, AM. BAR ASS'N, LEGAL EDUCATION AND PROFESSIONAL DEVELOPMENT—AN EDUCATIONAL CONTINUUM: REPORT OF THE TASK FORCE ON LAW SCHOOLS AND THE PROFESSION: NARROWING THE GAP 3–5 (1992) [hereinafter MACCRATE REPORT] (proposing that many law school curricula should do more to provide the training and skills required to produce competent lawyers). The MacCrate Report begins with a description of "The Profession for Which Lawyers Must Prepare" and identifies changes in the profession, including the growth of the large firm, specialization, advertising, government law departments, and the legal needs of the public. *See id.* at 9–119. The MacCrate Report asserts that law schools must respond to changes in the profession by making changes in legal education. *See id.* at 233–36, 330–31. The MacCrate Report also states that studies "demonstrate that relatively few law students have exposure to the full range of professional skills offerings." *Id.* at 240. *See generally* Russell Engler, *The MacCrate Report Turns 10: Assessing Its Impact and Identifying Gaps We Should Seek to Narrow,* 8 CLINICAL L. REV. 109 (2001).

50. *See* Sheppard, *supra* note 29, at 550 (stating that the case method has dominated law school instruction for a hundred years and that most of its practitioners have "little thought of other teaching methodologies"); *see also* Robert E. Oliphant, *Will Internet Driven Concord University Law School Revolutionize Traditional Law School Teaching*?, 27 WM. MITCHELL L. REV. 841, 841 (2000) ("Despite repeated calls for change and reform, faculty and administrators appear comfortably entrenched in an environment that functions, in many ways, much as it did a century ago."). Just as professors should not ignore online legal education, be it an entire online law school such as Concord University Law School (http://www.concord.kaplan.edu), or teaching assistants and supplemental aids such as Computer-Assisted Law Instruction (http://www2.cali.org), neither should law professors ignore the advent of classroom display technology.

"bowl of mush" (a law student's brain) into a highly trained, analytical mind so that, by the end of law school, the law student has learned "how to think like a lawyer."[51]

Some law schools are keeping up with—and even leading—the legal profession with respect to state-of-the-art technological courtrooms and classrooms. For example, at Southwestern University School of Law in Los Angeles, the Julian C. Dixon Memorial Courtroom and Advocacy Center is acknowledged as among the most modern, technological courtrooms in the country.[52] However, equipping law school courtrooms and classrooms with display technology does little good if the professors do not use it.

If law students should be learning how to "think like a lawyer,"[53] then perhaps it is fair for those law students to expect their professors to know how to *teach* like a lawyer.[54] Since cutting-edge lawyers are successfully persuading juries in modern courtrooms by explaining and simplifying their cases by using display technology,[55] then why shouldn't law professors teach their law students in the very same, effective manner?[56] Law professors could be exposing their students to the benefit

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51. *See* Galves, *supra* note 12, at 277 n.370.

52. *See* Andrew Taslitz, *Digital Juries Versus Digital Lawyers*, 19 CRIM. JUST. MAG., Spring 2004, at 4, *available at* http://www.abanet.org/crimjust/cjmag/19-1/digitaljuries.html (last visited June 6, 2005).

> This new high-tech courtroom will be able to serve the legal profession and the community as well as aiding in educating law students in digital technologies. The courtroom includes a multimedia and Web-based evidence presentation system; an audio–visual system encompassing remote conferencing capabilities that accommodate multiple participants, even in judicial chambers; individual monitors and large-screen displays for attorneys, judges, jurors, and observers; an automated court reporting system; foreign language interpretation; technologies to assist the handicapped; state-of-the-art acoustic balancing and sound systems; and a technology augmented jury deliberation room designed according to research guidelines funded through the State Justice Institute.
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> This is the latest high-tech training courtroom; earlier ones [include] the Courtroom 21 Project at William and Mary School of Law in Virginia [and] the National Judicial College at Reno, Nevada . . . .

Id. For further elaboration regarding the Julian C. Dixon Memorial Courtroom and Advocacy Center, see http://www.swlaw.edu/campus/dixoncourtroom.html (last visited Mar. 31, 2005), especially the "Spotlight" link to the courtroom.

53. It has been suggested (and questioned) by more than Professor Kingsfield that law school should teach students how to think like a lawyer. *See generally* Nancy B. Rapoport, *Is "Thinking Like a Lawyer" Really What We Want to Teach?,* 1 J. ASS'N LEGAL WRITING DIRECTORS 91 (2002) (questioning what "thinking like a lawyer" really means, whether we should be teaching whatever it is as a paramount goal in law school, and, if so, addressing how exactly we should do it).

54. *See supra* notes 35–51 and accompanying text.

55. *See* S. Johnson, *www.lawschool.edu*, *supra* note 26, at 101 (reporting that "technology is becoming increasingly central to the practice of law, and law schools have an obligation to train students to use technology"); *supra* notes 32–51 and accompanying text.

56. *See* Constance Frisby Fain, *A Methodology for Teaching Constitutional Law*, 21 SEATTLE U. L. REV. 807, 824 (1998) (reviewing JEROME A. BARRON ET AL., CONSTITUTIONAL LAW: PRINCIPLES AND POLICY (1996)).

of display technology used in the legal profession, while simultaneously connecting with students at a superior communication level, by taking advantage of the students' developed ability to assimilate information through a combination of images and sound.[57] Law schools owe a duty to their students to educate them about the modern practice of law,[58] and fulfilling this duty requires the advancement of teaching techniques.[59] Students should learn how to use technology, and such technology should also be used to enhance teaching itself.

This is not a call to abandon legal pedagogy as we historically have known it, but only to incorporate it fully into the technology age.[60] Law professors should consider the visual learning environment from where

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> Students have told me that the utilization of charts and diagrams, in conjunction with the casebook and lectures, enhances their knowledge, understanding, and analytical skills. The reason behind the students' positive response to the lecture and visual-aid approaches may be due in large part to the fact that many students prefer to learn by seeing and hearing . . . .

Id.

57. *See generally* Maria Perez Crist, *Technology in the LRW Curriculum—High Tech, Low Tech, or No Tech*, 5 LEGAL WRITING 93, 93–123 (1999) (discussing certain classroom technologies and assessing their effectiveness as teaching tools); *see also* Stephen Gillers, *Getting Personal*, 58 LAW & CONTEMP. PROBS., Summer/Autumn 1995, at 64–72 (reviewing the use of video vignettes in teaching professional responsibility and student responses to them); William H. Lawrence, *Diagramming Commercial Paper Transactions*, 52 OHIO ST. L.J. 267, 267–78 (1991) (illustrating a way to visually diagram the relationship among facts, parties, and corresponding legal principles involved in complex legal theories in order to increase students' comprehension); William M. Richman, *Graphic Forms in Conflict of Laws*, 27 U. TOL. L. REV. 631, 631–56 (1996) (outlining the author's success at incorporating visual aids into his Conflict of Laws class to increase students' comprehension).

58. *See* Engler, *supra* note 49, at 109–69; Matasar & Shields, *supra* note 30, at 910 (asserting that "[l]aw school graduates will be ill-prepared for their future careers if their schools do not learn to change and adapt, especially to emerging technologies").

59. *See* Matasar & Shields, *supra* note 30, at 909 (analogizing the implementation of change in law school to moving a graveyard). There is often resistance by educators to use new developments in technology. Perhaps there is concern about teachers getting on the latest bandwagon when it is unknown whether the new technology can have a positive impact. Perhaps this is because in teaching, whether in law school or elementary school, teachers are used to being in charge of their classroom. The thought of an outsider telling them how to teach might not be welcomed. *See also* LARRY CUBAN, TEACHERS AND MACHINES: THE USE OF CLASSROOM TECHNOLOGY SINCE 1920, at 51 (1986).

> It has been found that teachers reject or at least resist change because of failure to recognize the need for improvement, fear of experimentation, unwillingness to give time, and disillusion or frustration with past experiences. In addition teachers traditionally tend to be conservative and usually will not be impressed by the results of investigations and research or new theories of education.

Id. In the law school context, for example, the use of computer-based legal research through Lexis/Nexis and Westlaw was met with resistance from legal educators at first. *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, 146 (1997). Now, use of Lexis/Nexis and Westlaw is widespread, and even required, in law schools. Just as computer-based legal research was first resisted and later accepted, the use of display technology in the law school classroom undoubtedly will become widespread.

60. For example, law professors have been using the Socratic case method of instruction for over a century. Russell L. Weaver, *Langdell's Legacy: Living with the Case Method,* 36 VILL. L. REV. 517, 541–43 (1991). This article is not a critique of that method or any kind of call for change on that score. However, consider the initial resistance to the Socratic case method when first introduced and then the resistance to abandoning it as an example of how difficult it is to change the status quo in law instruction. *See* S. Johnson, *www.lawschool.edu*, *supra* note 26, at 88 ("Langdell's student-centered, active learning approach eventually displaced the traditional lecture format in most law schools, and law schools have been reluctant to depart from it, despite a variety of criticisms of the approach.") (citations omitted).

our students come[61] and should view teaching with display technology as a way to assist students to practice in a modern, visually oriented, and technology-dependent world.[62] After all, these students will be twenty-first century lawyers who must communicate with, and ultimately persuade, twenty-first century judges, jurors, and attorneys,[63] all of whom will be living in an even more visually reliant and technologically oriented society. Law students' first exposure to display technology should not be after they have graduated law school and are practicing law. Instead, that exposure should be much earlier in their legal training.

III. DISPLAY TECHNOLOGY: THE SUPER-CLASSROOM CHALKBOARD

A. Display Technology in the Classroom: Examples from the Real World

The main courses I teach at the University of the Pacific, McGeorge School of Law in Sacramento, California, are Civil Procedure, Evidence,

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61. S*ee id*. at 94 (elaborating on how students today are dependent on using technology to aid their studies).

> [M]any students are bringing laptops into the classroom to save briefs and outlines and to take notes. Some faculty have expressed concern that students will disengage from class as they become preoccupied with transcribing class discussions or engaging in other extracurricular activities if the laptops can access a local area network or the Internet, or that keyboard noise will significantly disrupt the concentration of other students. Despite these concerns, laptops are being used in many classrooms with few ill effects.

Id.

62. *See, e.g., id*. at 94–95 (describing how "[m]any faculty have created course websites that may include the syllabus for the course, electronic 'handouts' and course materials, links to websites that are related to the material covered in the class, model exams and answers, and lecture recaps").

> E-mail and Internet discussion forums are also central features of many law school classes. E-mail and forums allow students to continue class discussions with each other and their teacher outside of the traditional classroom. These tools also allow faculty to respond to targeted questions that students were unable to raise during class. E-mail and discussion forums can also be used to conduct short answer quizzes or to address administrative issues outside of class time.

Id. at 95–96.

63. *See* Matasar & Shields, *supra* note 30, at 913 ("The challenge for law schools is to find ways to optimize students' legal education by employing the appropriate technological tools. Law school graduates must come to practice with the real-life tools that will help them compete with, or even eclipse, their more traditional colleagues."). "[S]eventy-six percent of the lawyers in reporting firms have a computer or terminal near their desks . . . . Lawyers . . . now have access to computers and computer networks throughout the world." *Id.* at 911–12. *See also* Fred Galves, *Seeking Tech-Savvy Associates: Which Prospective Employee Is Right for Your Firm?*, LAW OFFICE COMPUTING MAG., Feb./Mar. 2005, at 70 (discussing the legal technology knowledge and skills that employers should look for in hiring law student candidates); Marilyn R. Walter, *Retaking Control Over Teaching Research*, 43 J. LEGAL EDUC. 569, 569 (1993) (suggesting that students come to law school eager and fearless to learn to use computers but are inept in that regard, and that their lack of fear is attributed to a familiarity with computers that students just five years ahead of them did not have); Lederer, *Courtroom Practice*, *supra* note 34, at 41 (explaining that in 1999 there were "about 50 integrated high-tech courtrooms in the United States" and that by the mid-twenty-first century these courtrooms should be common; and also that "[l]aw schools will extend trial advocacy instruction to litigation technology as well as to more traditional subjects"); *Tête-à-tête, supra* note 31, at 78 (discussing the emergence of technology in the courtroom). S*ee generally* Ronald W. Staudt, *Does the Grandmother Come With It?: Teaching and Practicing Law in the 21st Century*, 44 CASE W. RES. L. REV. 499, 515, 519 (1994) (noting the legal profession's increasing reliance on computers in all areas of practice).

Banking Law, Civil Pre-Trial Litigation, and Computer-Assisted Litigation.[64] In these courses, I use display technology extensively during each class to accomplish several pedagogical goals. For example, I use display technology to summarize what we covered during the previous class in order to emphasize the importance of synthesizing the material, reinforcing it, and building upon what we have already learned.[65] When calling on a student to state the facts of a case, I use the computer to diagram and highlight the key facts of that case as the student relates them so that the class will understand which facts are most important.[66] I build diagrams of various legal doctrines so that students can understand visually how a legal concept operates.[67] I present categorical relationships to demonstrate interrelationships and interdependencies in the law.[68] I remind students of key text from the rules and cases so that we can explore the gaps, conflicts, and ambiguities in the specific text—an exercise that is much easier to accomplish when the pertinent text appears in large print for the class to see, especially when I want to highlight or emphasize certain key words or phrases.[69] I occasionally will show computer animations to my Computer-Assisted Litigation class and create hypotheticals based upon them. For example, I might show a computer animation (i.e., recreation) of a one-car Jeep rollover and pose the hypothetical that it was created by an expert witness and a plaintiff wants to introduce it at trial.[70] Then I will give the class additional facts that call into question the validity of the animation and ask them to brainstorm about what evidentiary objections they, as defense counsel, could make to exclude the evidence.

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64. At University of the Pacific, McGeorge School of Law, Civil Procedure and Evidence are required courses, while Civil Pre-Trial Litigation and Banking Law are electives, as they are at most law schools. Computer-Assisted Litigation is a new elective course I developed in 2002 and co-instruct with Mr. Tim Piganelli, owner of Legal Technology Consulting based in Phoenix, Arizona. In Computer-Assisted Litigation, we teach law students advanced litigation methods, strategies, and tactics focusing on the usage of various computer software programs to (1) organize and manage documents and other case materials; and (2) display exhibits at trial or in other advocacy settings. The course description for Computer-Assisted Litigation is as follows:

> An introduction to the use of various pre-trial and trial litigation computer programs and software technology. Students spend the first [part] of the course organizing a document intensive case and the second [part] of the course preparing key exhibits for trial presentation. Students will learn the tactical, evidentiary and technical issues that such use [sic] of technology raise, working with cutting edge litigation software and technology display systems that will soon be expected of 21st Century law grads.

Univ. of the Pacific, McGeorge School of Law, Academics: 291 Computer-Assisted Litigation (2), *at* http://www.mcgeorge.edu/academics/curriculum_catalog/full_course_descriptions/computer_assisted_litigation.htm (last visited June 23, 2005). I also have used display technology while visiting at University of California, Davis and Fordham law schools, and currently at Southwestern University and Denver University law schools, where I am visiting for the 2004–2005 academic year.

65. For an example, see the PowerPoint slides and other display technology media at http://faculty.mcgeorge.edu/galves/radiostar.htm.

66. *See id.*

67. *See id.*

68. *See id.*

69. *See id.*

70. *See id.*

In all of these examples, the class can better follow the particular issue being discussed, since they can refer to the pending issue on the screen as they wrestle with the substantive legal issue at hand. Class discussion is more organized and focused than it is without visual displays because verbal misunderstandings of facts, hypotheticals, and key language are minimized. By using a technological tool to enhance communication, I lead by example so that students will see the benefit of presenting information in an effective and visual way. As a result, students may apply the method themselves in the future.[71]

Logistically, in terms of the actual equipment needed to display computer-generated images in a classroom, one needs only three basic items: (1) a classroom computer equipped with an appropriate software display program; (2) a connection to a quality computer projector that can project images; and (3) a screen large enough for optimal class viewing. At the University of the Pacific, each classroom has a lectern with a built-in computer connected to the law school's main computer network,[72] as well as a projector attached to the ceiling of the room. The projector displays bright, clear images of the professor's podium computer screen onto a large screen above and behind the professor.[73]

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71. There is a saying that teaching involves more than things being taught—that students are not only "taught" something, but that they also can be "caught" by something. *See* David T. Link, *Foreword* to Symposium, *The Times—They are Changing*, 15 NOTRE DAME J.L. ETHICS & PUB. POL'Y 1, 3 (2001) (explaining that law is easier "caught" than "taught"). "Law schools shape students into skilled and decent professionals not so much by what is said in the classroom, but by the example set by the faculty. Through exposure to these role models, students absorb the skills and values needed to practice law . . . ." *Id*. In this way, students may witness something regarding visual presentation and communication, and then come to their own conclusions as to its value and intrinsic worth while practicing law.

72. Because the classroom computer is connected to the law school's main computer network, I can access all of the files in my desktop computer located in my office from the classroom computer. This way I do not have to transport floppy discs, CDs, jump-drives, or even my laptop to class in order to transfer files to the classroom computer's hard drive. However, it is good practice to bring a printed hard copy of the presentation to class in the event that there is a problem with the hardware or software. Having a backup is important because, if there is a technology problem, the show must go on. In the last seven years of teaching with technology, a hardware or software problem like this has happened to me only once—a projector was set to play a video from a VCR and I did not know how to change it over to project what was on my computer. I later learned the simple flick of a button on the mouse was all that it took to remedy that particular problem.

73. Classrooms at the University of the Pacific, McGeorge School of Law are equipped with custom-made, lockable podiums. Housed inside the podium is a microphone; a 15-inch monitor; and a computer with a Pentium IV processor, a video card, a sound card, both floppy and CD/DVD drives, and a network connection. A ceiling-mounted projector provides a 100-inch-diagonal display on a screen located behind the podium. All classroom audio–visual needs are handled by this configuration. One remote control operates all equipment functions, including projector operation, mouse control, and video playback of the DVD material. This makes it possible for a professor to walk around the room during class and present material without having to remain at the podium in order to operate the computer. The professor logs in to the computer at the beginning of class and is able to access all of his or her personal network files. Each classroom is equipped with identical equipment, lighting adjustments, and screens in order to standardize computer-display presentations in any classroom. Software available on all classroom systems is as follows: Corel WordPerfect Suite 9 with WordPerfect and Presentations, MS Office 2000 with MS Word and PowerPoint, GroupWise 5, Windows Media Player, QuickTime Player, Real Player, and Internet Explorer (with direct links to Lexis/Nexis and Westlaw). If a professor needs any additional software, it will be loaded on that

Lighting works best if the lights directly above the screen can be dimmed or shut off while keeping the rest of the classroom lit. The classroom computer is also connected to speakers in the classroom so that sound effects can be played for the class.[74]

Various display programs allow a professor to create the images for class. I use Microsoft PowerPoint for its ease and scalability.[75] Presentation software such as PowerPoint allows one to prepare and manipulate the precise order of the information displayed.[76] With every passing year, the software and hardware become better, faster, less expensive, and more user-friendly.[77]

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particular classroom's computer. Several additional classrooms have been further renovated to include the following: a custom-constructed ADA-compliant podium with keyboard; an LCD podium monitor; four 42-inch plasma displays for videotape or DVD presentations; connections for laptop computer display; a classroom wireless access point; and special classroom lighting. Although all of this may sound highly technical, it actually is quite easy to use once it is initially set up by the school's information technology department. So just as one need not become an expert mechanic to drive a car, one also need not become a computer expert to use display technology in class. I extend a special thanks to Ron Marcroft, head of Media Resources at University of the Pacific, McGeorge School of Law, for providing this technical information about the classrooms.

74. For example, video and audio clips can be placed on the class computer hard drives and mapped to various function keys on that computer. During class, the professor can strike a key to play a short video clip, music clip, or applause sound wave—whatever might be relevant to the student's answer. For instance, I occasionally will play the theme from *Jeopardy* if a question is particularly tough, or cheering and applause for a correct answer to a difficult question. These clips are used as reinforcement or levity. Also, professors can play music files from the classroom computer before class as a mood-setter. I am a disc jockey of sorts as I play contemporary pop, rap, rock, classic rock, and occasionally jazz or classical music on the computer CD player so that students can enjoy music just before class begins (when the music stops, it notifies the students that class is about to begin). For an example, see http://faculty.mcgeorge.edu/galves/radiostar.htm. Sometimes I will use audio clips to ask hypothetical questions, perhaps regarding admissibility of evidence. For example, I may play a voicemail recording of a caller who witnesses an accident as he is driving and proceeds to describe the events. I then ask if the recording is admissible, inadmissible hearsay, or an exception to hearsay, thereby testing their knowledge of the hearsay rules. Sometimes the primary use of sound effects and music are to set a relaxed mood in class and have no deep pedagogical justification, but I assume no one would judge a professor's teaching based upon the occasional telling of an unrelated verbal joke before class, for example, as long as it is would not become too annoying. Thus, criticizing technology in the classroom simply because music or sound effects can be used in a relaxing or funny way seems misplaced, unless of course the music or humor is overused or is in bad taste. Finally, and perhaps most importantly, students in class can participate by showing presentations from the Internet, Lexis/Nexis, Westlaw, or PowerPoint. This provides a wonderful opportunity for students to develop their own computer presentation and persuasion skills.

75. In addition to PowerPoint, there is another popular computer display program, Presentations, manufactured by Corel (which also distributes WordPerfect, a common word-processing program). PowerPoint and Presentations are very easy to use. Once you learn one of them, the other is easy to learn, much like learning MS Word is easier to learn if you already know how to use Corel WordPerfect, or vice versa.

76. *See supra* notes 67–72 for examples of how text can be layered, highlighted, or animated for emphasis, as well as how diagrams or even photos can be used to make points visually and dramatically.

77. *See* Nicolas P. Terry, *Bricks Plus Bytes: How "Click-and-Brick" Will Define Legal Education Space*, 46 VILL. L. REV. 95, 95–96 (2001) (explaining that recently law schools have dramatically increased their IT budgets and as a result "[e]thernet cables snake through our walls and data projectors have sprouted from our classroom ceilings . . ."). I started using technology as a teaching tool before law schools began retrofitting their classrooms to accommodate such technology. I had to use my own laptop computer and connect it to a projector, which I would wheel into class on a cart and project images onto a portable screen that I also would have to transport and set up. I was a

Notwithstanding the relative ease of using and learning display technology in class, law professors may still balk at the prospect of having to learn a display technology program just to teach.[78] However, a professor does not have to become a computer expert, as display software programs do not require an inordinate amount of time, effort, or expertise to learn and master.[79]

An analogy is helpful to understand the extent that display technology does require some preparation on the part of the professor to learn how to use the technology. Part of our teaching and scholarly function as law professors is to engage in writing—the writing of books, articles, or other scholarly works.[80] As a practical matter, this writing component will most likely require professors to learn how to use a word processing program. Professors have adapted to word processing programs to produce legal scholarship without too much complaint or resistance, and presumably the investment of time in learning the program has been well spent.[81]

Similarly, if law professors want to conduct computerized legal research, they must learn how to use a computerized legal research program such as Lexis/Nexis or Westlaw[82] instead of relying exclusively on manual research digests.[83] Furthermore, if professors want to

visiting professor at University of California, Davis Law School in 1996 and Fordham Law School in 1997. Neither school at that time had retrofitted any classrooms for technology, although both have done so since. I also had to address problems with lighting, such as how to shut off the lights near the screen in order to make the image visible while keeping at least some of the lights in the room on so that students could see to take notes, and not be tempted to fall asleep if it got too dark. Today, the quality of projectors is much better and there are many that can project visible images in full classroom light. Boxlight, Purchasing a Projector for Education: Weighing the Options, *at* http://www.boxlight.com/education/Purchasing_Projectors.asp (last visited Mar. 31, 2005).

78. I have no empirical data on this point, so it is anecdotal. However, over the years, many professors have related to me that the extra work involved in having to learn another software program, such as PowerPoint, and the additional time required to create presentations for each class are reasons not to adopt the usage of display technology in their classrooms.

79. *See* DEANNE C. SIEMER ET AL., POWERPOINT FOR LITIGATORS, at xv (2000) (stating that "PowerPoint is fast and easy" and that using it does "not require extensive computer experience"); *see also* James B. Pepe, *Going on Trial Means Going High-Tech*, NAT'L L.J., Mar. 19, 2001, at B9 (stating that PowerPoint is easy to learn and use).

80. Most law schools require junior professors to author articles for publication in legal journals in order to receive promotions and eventually tenure. *See* Tracey E. George, *Court Fixing*, 43 ARIZ. L. REV. 9, 41 (2001) (stating that law professors gain tenure by writing law review articles that take a particular approach to a legal issue); Kenneth Lasson, Commentary, *Scholarship Amok: Excesses in the Pursuit of Truth and Tenure,* 103 HARV. L. REV. 926, 927 (1990) (purporting that, for professors, "the goal of publication is much less to find answers than to avoid perishing in pursuit of promotion and tenure").

81. *See* Saxer, *supra* note 26, ¶ 9 (stating that virtually all law school professors use computer word processing programs to write).

82. *See* Robert C. Berring, *Collapse of the Structure of the Legal Research Universe: The Imperative of Digital Information*, 69 WASH. L. REV. 9, 28–31 (1994) (specifying the ways in which computerized databases such as Westlaw and Lexis/Nexis have revolutionized legal research).

83. Legal encyclopedias such as *American Jurisprudence Second* and *Corpus Juris Secundum* cover all areas of law and are updated regularly. LARRY L. TEPLEY, LEGAL RESEARCH AND CITATION 75 (4th ed. 1992). Annotations such as *American Law Reports* include judicial opinions with accompanying explanatory notes. *Id.* at 100. West Publishing Company publishes state, regional, and

communicate instantaneously with their students or colleagues in written form, then they have to learn how to use e-mail[84] instead of hand-writing notes. Finally, if professors want to have access to instant news or information, then they must learn how to access and use the Internet[85] instead of relying on magazines or newspapers.[86] If professors can make these technological adjustments to enhance their professorial duties as writers, then they can also easily learn how to use technology in the classroom to enhance their duties as educators.

B. Personal Evolution Regarding Visual Aids in Teaching

My recognition of the power of visual aids in the classroom began long before I became a law professor and even preceded the time when I was a practicing attorney. My realization had its genesis when I was a student.[87]

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federal digests that include headnotes organized by topic and key number. *Id.* at 32. From these digests a researcher can locate judicial opinions that fall under the desired topic and key number. *Id*. For a complete explanation of manual research resources, see *id*. at 6–38. The disadvantage of manual searches is that not all of the actual text of judicial opinions or other searchable text is considered; rather it is only the way in which a digest author has decided to categorize possible sources of law. Furthermore, time and convenience issues are more acute when researchers must physically search for books or materials in a library, rather than searching electronically and locating applicable cases instantly from their desktop computers.

84. *See* Saxer, *supra* note 26, ¶ 5 (explaining that Westlaw and Lexis/Nexis have developed online support services for legal educators that "facilitate communication with students by allowing online uses such as posting syllabi, course assignments, documents, presentation materials, and maintaining class discussion lists"). The West Educational Network (TWEN) is one such popular product, and Lexis/Nexis also offers a similar product. *Id.* S*ee also* Terry, *supra* note 79, at 113 (stating that most communication between law school students and law school professors takes place electronically, mainly through e-mail).

85. *See* Berring, *supra* note 82, at 29–30 (explaining that online information systems have revolutionized access to news and information).

> Materials that were once held in the sub-basements of only the best law libraries are now as easily retrieved on LEXIS and Westlaw as a Supreme Court decision. International materials are also increasingly available. The same is true of secondary sources and even non-legal research sources. The researcher who turns on her LEXIS subscription today is the virtual equivalent of the researcher walking into the Harvard Law Library in 1960. The rare materials are not there, but much non-legal information is, and it is a good trade-off. Thus the databases have expanded the literature that is easily accessible.

Id.

86. The Internet has constant news updates throughout the day, making it the most up-to-date news service available. *See* Daniel M. Filler, *From Law to Content in the New Media Marketplace,* 90 CAL. L. REV. 1739, 1760 (2002). "The web houses web-only sites as well as many sites linked to non-Internet content providers such as newspapers, magazines, television stations, and advocacy groups." *Id.* For example, CNN.com "is updated continuously throughout the day" and is staffed around the clock. CNN.com, Contact Us, *at* http://www.cnn.com/feedback/help (last visited Mar. 31, 2005).

87. It is important for professors to empathize with students, or at least be able to look inward and consider their own experiences as students, in order to look for insights about teaching. *See* Jennifer P. Lyman, *Getting Personal in Supervision: Looking for that Fine Line*, 2 CLINICAL L. REV. 211, 219 (1995) (arguing that professor empathy towards students "guide[s] the exercise of power in a relationship with an inherent power imbalance" and "provides a necessary check on the exercise of paternalism"); *see also* Joshua D. Rosenberg, *Teaching Empathy in Law School*, 36 U.S.F. L. REV. 621, 632–33 (2002) (finding that professors displaying empathy are better able to educate than professors who possess more knowledge but do not display empathy).

1. Life as a Student

From my time as a kindergarten student in Pueblo, Colorado, all the way up to my years as a law student, I found the most effective teachers to be those who peppered their explanations of difficult concepts with specific examples that provoked visual images for my mind's eye.[88] This technique allowed me to assimilate complex concepts by decoding words *and* by looking at their meaning through a familiar visual prism. This aided my overall learning in at least three ways.

First, I was able to learn the concepts more completely, as visual aids allowed a deeper contemplation of the concepts. Second, the concepts I learned from processing abstract language were reinforced by my perception of those same concepts in visual imagery that engaged another facet of my mind. Third, my retention improved as the concepts I learned were categorically associated with other visual images already embedded in my memory.[89] Feeding complex information to the mind through imagery *and* sound is key because sight and hearing are most effective when used in tandem. Indeed, one of the most important lessons in clear communication that schoolchildren learn is the art of show-and-tell.[90] As course subjects became more complex, I found there should be even more reason to use two senses in teaching and learning instead of just one.[91]

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88. *See* Vernellia R. Randall, *The Myers–Briggs Type Indicator, First Year Law Students and Performance*, 26 CUMB. L. REV. 63, 87 (1996) (noting that many students learn best when given concrete, specific examples that "allow them to move to abstract theory in a step-by-step progression"). According to one survey, 48.1% of students qualify as "sensing" on the Myers–Briggs scale, which means that learning by presentation of "principle or rule followed by many examples of variations in applying it" is particularly effective for them. *Id.* at 86–87. For those unfamiliar with the Myers–Briggs Type Indicator (MBTI) psychological test, a thorough overview is available at http://en.wikipedia.org/wiki/Myers_briggs (last visited June 23, 2005).

89. *See Panel One: Judge–Jury Communications* in Symposium, *Improving Communications in the Courtroom*, 68 IND. L.J. 1037, 1040 (1993) (discussing the power of visual aids in improving comprehension); *see also* Paula Lustbader, *From Dreams to Reality: The Emerging Role of Law School Academic Support Programs,* 31 U.S.F. L. REV. 839, 850 n.36 (1997) ("It is [the] binding of declarative and associational knowledge within a coherent memory structure that turns otherwise disjointed bits of information into meaningful patterns of thought and accounts for systematic efforts in human processing.").

90. *See* La Monica Everett-Haynes, *Show and Tell Goes Modern, Lessons in Communication Transform Old School Exercise*, SEATTLE POST-INTELLIGENCER, Dec. 3, 2002, at B3 (reporting that many elementary school teachers believe that show-and-tell sessions improve student communication and independence). According to one teacher, show-and-tell "expands what [the students are] learning in the classroom and helps them to make connections between home and school." *Id.* Even elementary school teachers understand the importance of visual communication.

91. At the most complicated academic levels of science, math, economics, medicine, and business, I saw that such learned textbooks all used complex diagrams, drawings, or even photographs, whereas books that merely entertained, such as fictional novels, used only words with no explanatory, illustrative diagrams. Thus, the argument that visual aids "dumb down" the lesson or are "nonacademic" seems to be backwards. *See* Janice C. Griffith, *The Dean's Role in Managing Technology*, 33 U. TOL. L. REV. 67, 72 (2001) (explaining that many law professors, who were taught in classrooms without visual aids, believe the Socratic method "should not be eclipsed" by PowerPoint presentations or other technologies). *See infra* Section IV, addressing this specific critique in detail.

Even as a child outside of a formal academic setting, I can recall that when building a model airplane, the written instructions that explained the various steps in constructing the model often did not make sense until I also saw the visual diagram of how the parts fit together. This is not to say that I would have wanted *only* the diagram. My point is not that one should merely *replace* the verbal with the visual or even say that the visual is more important than the verbal. Rather, this "double dose" of information, both verbal *and* visual, made it possible for me to build the airplane with ease. In a sense, it gave me two simultaneous opportunities to learn how to complete the desired objective. Although law is often intangible, the art of teaching involves simplifying the complex and making difficult concepts more understandable and accessible as tangible, concrete ideas.[92]

As I advanced in school, I saw that visually enhanced learning was accomplished most often by the teacher's use of a chalkboard, or even by physical hand gestures and in-class demonstrations.[93] In many ways, providing a visual aid is like providing a helpful metaphor or analogy to help explain an idea.[94] The use of analogies and metaphors should not be considered a nonacademic oversimplification that is beneath legal education. After all, legal analysis itself often employs the art of "reasoning by analogy,"[95] as judges and lawyers use metaphors and

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92. *See generally* Randall, *supra* note 88, at 87. S*ee, e.g.*, Roger Bernhardt, *Teaching Real Property Law as Real Estate Lawyering*, 23 PEPP. L. REV. 1099, 1187 (1996) (indicating that a professor who complicates rather than simplifies a concept is "the last thing unconfident first-year students need"); Peter Dewitz, *Reading Law: Three Suggestions for Legal Education*, 27 U. TOL. L. REV. 657, 672 (1996) (stating that students' comprehension will improve if professors "help students understand the basic concepts and structures of ideas" before the students read).

93. For example, a teacher walking around the room while lecturing would be a way to teach visibly. *See* Sherry Jordon, *Treat Students to a Moving Experience*, THE TIMES HIGHER EDUC. SUPPLEMENT, July 20, 2001, at 24 (explaining that conscious use of body language and space allows teachers to more creatively and effectively communicate with students). This simply underscores the point that we limit our communication avenues if we choose to communicate only through verbal language without the benefit of supplemental visual imagery and demonstration. This is also demonstrated by the importance placed upon demeanor evidence and the strict limits traditionally placed upon trial use of depositions and transcribed testimony taken in other proceedings. The opportunity of the trier to observe the demeanor of witnesses is a principal basis for the deference accorded by reviewing courts to factual determinations of trial courts and hearing officers. *See* Olin Guy Wellborn III, *Demeanor*, 76 CORNELL L. REV. 1075, 1076–77 (1991) (explaining the importance the law places on demeanor evidence).

> [T]he way a man behaves when he tells a story—his intonations, his fidgetings or composure, his yawns, the use of his eyes, his air of candor or of evasiveness—may furnish valuable clues to his reliability. Such clues are by no means impeccable guides, but they are often immensely helpful. So the courts have concluded.

JEROME FRANK, COURTS ON TRIAL 21 (1995). It is therefore important to realize the significance and potential use of visual imagery, demonstration, and even demeanor in teaching.

94. *See* Todd Brower, *A Stranger to Its Laws: Homosexuality, Schemas, and the Lessons and Limits of Reasoning by Analogy*, 38 SANTA CLARA L. REV. 65, 71 (1997) (explaining that reasoning by analogy is a method of learning new concepts through past experiences). In reasoning by analogy, individuals "refer to [their] ability to extract meaning from [their] interactions with [the] environment or from cases, and apply those understandings to novel situations." *Id.*

95. *See* Scott Brewer, *Exemplary Reasoning: Semantics, Pragmatics, and the Rational Force of Legal Argument by Analogy*, 109 HARV. L. REV. 925, 926 (1996) (detailing the reasoning process of

analogies in their judicial opinions, closing arguments, and legal briefs.[96] A visual aid creates a desired image in the mind of the listener to help that person understand a specific point, just as an analogy or metaphor would. In fact, the tangible visual aid is more direct in creating the desired mental image because it can be controlled more effectively by the presenter, and it is easier to create than an indirect mental picture constructed with words alone. Additionally, the indirect mental picture may or may not create the exact desired mental image in the mind of each audience member as the presenter intends.[97]

For many years I have emulated those teachers who were most effective in using visual aids in teaching me. Many students benefit from visual reinforcement of whatever particular concept is being taught.[98] While many professors throughout academia became sold on the use of

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"reasoning by analogy," which has "special prominence in legal reasoning"); *see also* Steven M. Quevedo, *Formalist and Instrumentalist Legal Reasoning and Legal Theory*, 73 CAL. L. REV. 119, 142 (1985) (explaining that reasoning by analogy involves a judge focusing on a relevant similarity or difference between two situations).

> [Reasoning by example] is a three-step process described by the doctrine of precedent in which a proposition descriptive of the first case is made into a rule of law and then applied to a next similar situation. The steps are these: similarity is seen between cases; next the rule of law inherent in the first case is announced; then the rule of law is made applicable to the second case.

Quevedo, *supra*, at 142 (quoting EDWARD LEVI, AN INTRODUCTION TO LEGAL REASONING 1–2 (1948)).

96. *See, e.g.,* United States v. Bestfoods, 524 U.S. 51, 60, 69 (1998) (utilizing two analogies that draw upon visual images for their poignancy—"piercing the corporate veil" and director and officer "changing hats"—in discussing the liability of a parent corporation); *see also* Wong Sun v. United States, 371 U.S. 471, 487–88 (1963) (analogizing otherwise proper statements and tangible evidence gathered as a result of an initial constitutional violation at a crime scene to tainted "fruits of a poisonous tree"); Nunley v. City of Los Angeles, 52 F.3d 792, 796 (9th Cir. 1995) (noting that there are certain presumptions in evidence law entitling the proponent to an assumption that are like "bursting bubbles" in that they disappear as presumptions once rebuttal evidence is introduced); Republican Party of Connecticut v. Tashjian, 599 F. Supp. 1228, 1235 (D. Conn. 1984) (explaining Justice Brennan's "ratchet" theory of constitutional law: Congress may pass laws that strengthen rights under the Due Process and Equal Protection Clauses of the Fourteenth Amendment, but they may not pass laws that weaken those rights).

97. *See* Galves, *supra* note 12, at 187 (explaining that a speaker can better control what mental images a listener conjures up by using specific words and simultaneously displaying a picture of the desired mental image). For example, if a speaker says the word "dog," each listener will likely picture a different type of dog in his or her mind. *Id.* In contrast, if a speaker uses the specific word "collie," there will likely be more uniformity among the mental images conjured by the listeners, and the speaker will have better conveyed his desired message. *Id.* But, of course, the most detailed and specific information is best communicated with an actual picture of a specific collie rather than a long, detailed verbal description of a particular collie with seemingly infinite individual characteristics. *Id.* It is why, quite literally, "a picture is worth a thousand words." *See* Ralph Keyes, "NICE GUYS FINISH SEVENTH": FALSE PHRASES, SPURIOUS SAYINGS, AND FAMILIAR MISQUOTATIONS 27–28 (1992) (documenting the history of the famous phrase).

98. *See* M.H. Sam Jacobson, *A Primer on Learning Styles: Reaching Every Student*, 25 SEATTLE U. L. REV. 139, 151–52 n.50 (2001) (citing a study finding that a steadily rising 30% of law school students are visual learners—that is, they learn best through diagrams and charts rather than written text). Significantly, however, visual learners disproportionately have ended up at the bottom of law school classes. Perhaps it is because they are not being taught according to their visual learning style. *See id.* at 151–52. Although not yet a majority, the trend is moving in that direction and it seems irresponsible to mostly ignore the dominant learning style of nearly a third of all law students. Also, even if it is not the dominant learning style for two-thirds of law students, all students can still benefit from the added effectiveness of visual learning.

the chalkboard and visual aids in teaching,[99] I did so as a student, long before ever becoming a law professor.

2. Life as a New Law Professor

When I began teaching law in 1993,[100] before each class I wrote a class outline on the chalkboard setting forth the legal concepts and cases we were going to cover during that particular class. It included key text from the pertinent rules or cases. In addition, I would draw Venn diagrams[101] or other pictures to clarify particularly difficult legal concepts or factual situations.

For example, in Civil Procedure, I often drew timelines to help explain how to calculate the due dates of pleadings or discovery requests,[102] or displayed maps of the United States with pictures of a defendant's business activities or sales therein to explore personal jurisdictional issues.[103] In Evidence, I drew arrows indicating statements from one declarant to another and finally to a witness to demonstrate hearsay,[104] or I drew Venn diagrams to show the overlapping nature of character and credibility.[105] In Banking Law, I drew monetary flow charts to model complicated financial transactions between various business entities, lenders and guarantors, debtors and creditors, and also used the charts to compare the language of the applicable rule or statute.[106]

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99. *See* William E. Becker & Michael Watts, *Teaching Methods in U.S. Undergraduate Economics Courses*, 32 J. ECON. EDUC. 269, 275 (2001) (conducting a five-year survey of undergraduate economics courses and finding that teachers spend 83% of class time writing text and graphics on the chalkboard); *see also* Lawrence L. Smith, *The Future of Technology in Teaching*, USA TODAY MAG., Mar. 1999, at 26 (explaining that many teachers' primary teaching tools are chalk and a blackboard). While there do not appear to be statistics documenting chalkboard usage in law school classrooms, many authors have acknowledged its general use and acceptance.

100. I began teaching Civil Procedure, Evidence, and Banking Law in the fall of the 1993–1994 academic year at University of the Pacific, McGeorge School of Law. However, my first actual teaching job was at the undergraduate level beginning in 1986. During my third year of law school, I was a teaching fellow at Harvard University where I taught Principles of Economics. While later practicing law full-time, from 1987 to 1992, I taught a class called "Law and Social Justice" as a visiting professor in the political science department at Colorado College. In these undergraduate courses, I used the chalkboard extensively and occasionally distributed handouts, but at that time I never used any type of display technology.

101. *See* Samuel C. Damren, *The Utilization of Syllogisms in Contemporary Legal Analysis: Law, Logic and the Boolean Universe*, 1998 DETROIT C. L. REV. 63, 90 (1998) ("Venn diagrams utilize a . . . compressed geometric perspective to formulate the various possible relationships between groups. In Venn diagrams . . . distinct groups . . . are represented by overlapping circles.").

102. For an example, see http://faculty.mcgeorge.edu/galves/radiostar.htm.

103. *See id.*

104. *See id.*

105. Such an attack is allowed under Federal Rules of Evidence 608 and 609. For an example, see *id.*

106. *See id.*

Of course, many law professors already employ the chalkboard to some degree in their classes.[107] Interestingly, however, most law professors—even those who do not use the chalkboard—do not have to be convinced that using the chalkboard in class can be helpful, or at least that using the board is not a controversial teaching technique.[108]

Nevertheless, using display technology seems to present more pedagogical concerns for some.[109] I submit, however, that display technology should be embraced as the more effective teaching tool over use of the chalkboard or other stationary visual aids, such as hard copy flowcharts or handouts. I am not advocating a completely anti-chalkboard scheme by using display technology in the classroom. If anything, display technology is simply more of a glorified "super-chalkboard" that should be seen as a wonderful extension of the traditional chalkboard, rather than as some technological threat to traditional Socratic teaching methods.

3. From the Chalkboard to Class Handouts to Display Technology

Although I believed in the value of the chalkboard when I first began teaching, I became convinced that providing students with handouts of diagrams and flowcharts was even more helpful and efficient in transferring complicated information. However, I began to have many pedagogical concerns about using both the chalkboard and handouts in class. Regarding the chalkboard, I was concerned with the illegibility and lack of clarity of my chalkboard writing and drawings, as well as the inefficient use of valuable class time taken to write on the board. Although prepared handouts solved legibility and class-time problems, handouts often foster student passivity during class. By having a diagram of an entire analysis or flowchart of a case or legal issue in front of them at the beginning of class, students tended: (1) not to follow the layered elements closely as they were being discussed; and (2) not to write as many notes during class because most of the noteworthy information was already contained in the handout. As a result, I lost some control over the class because of the way in which students were using the handouts.

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107. *See* Robin A. Boyle & Rita Dunn, *Teaching Law Students Through Individual Learning Styles*, 62 ALB. L. REV. 213, 229, 232, 238 (1998) (describing ways that professors use the chalkboard—such as displaying key concepts and words or having students themselves write on the board—to appeal to different learning styles).

108. *See* James Eagar, Comment, *The Right Tool for the Job: The Effective Use of Pedagogical Methods in Legal Education*, 32 GONZ. L. REV. 389, 410 (1996–1997) (explaining that law professors commonly use chalk and a blackboard in their classroom instruction, but not more sophisticated audio–visual aids); *see also* Griffith, *supra* note 91, at 72 (stating that, since professors regularly use the blackboard during class, switching to electronic blackboards or slide projectors is not a major leap).

109. *See infra* Section IV (addressing various critiques of using display technology). *See generally* David M. Becker, *Some Concerns About the Future of Legal Education*, 51 J. LEGAL EDUC. 469 (2001) (warning that the use of display technology in the classroom might be sacrificing true learning because the medium becomes the message).

I have found that the use of display technology addresses each of these concerns while still allowing me to take full advantage of the power of visual learning in the classroom.[110] Each of these concerns and how display technology addresses them are set forth in more detail below.

a. Chalkboard Illegibility and Inefficient Use of Class Time

Although the chalkboard is great for emphasizing points, listing concepts, and making comparisons, I have found that students often have a difficult time reading my handwriting. This is especially true in larger classes where part of the problem is simply being able to clearly see the chalkboard. When I wrote large enough for all to see, I would run out of chalkboard space. When I drew diagrams, they often were not as clear and professional-looking as I would have liked. When I took the time to write slowly to avoid these problems, I lost valuable class time. Also, I often felt disconnected from the class while I was writing on the board and not facing the students. This disconnection occurred even when I spoke loudly or turned around in a contorted manner to remain facing the class.

Display technology solved all of these problems. Learning the law is difficult enough and it was a waste of time to require computer-savvy students to view the chalkboard from behind their laptop computers and spend mental energy attempting to decipher poor chalkboard writing and unclear drawings. This legibility problem is an unnecessary hurdle to place in front of students who should be concerned only with attempting to understand the substance of the law. Students should not struggle with chalkboard legibility and clarity issues when those problems can be easily solved. Trial attorneys know this—they are leaving behind chalkboards or butcher-block paper and markers for display technology.[111] This is because attorneys know the importance of

110. For an analogous discussion on why attorneys have moved from chalkboards and overheads to computer displays, see Taslitz, *supra* note 52, at 11.

> The laptop computer solved most of the problems inherent in older methods. The blackboard presents a near impossibility of adequately preserving for the record every action. Hand drawn flip charts are sometimes hard to read and favor the lawyer with good handwriting and an eye for perspective in drawing. A computer provides clear type and elegant design capabilities. Document blowups and photographic enlargements are time-consuming and expensive to create; and once completed, they cannot be changed. A computer can produce blowups and enlargements virtually cost-free with flexibility to change at any time.
>
> The lightweight, high-powered digital projectors also solved a principal problem with earlier technology. Slide projectors and overhead projectors require dimming of the lights in the courtroom. Newer digital projectors that take images from a computer have the projection strength to work well in full daylight.

Id. (quoting FRANK D. ROTHSCHILD ET AL., EASY TECH: CASES AND MATERIALS ON COURTROOM TECHNOLOGY 3 (2001)).

111. *See* Anthony J. Bocchino, *Ten Touchstones For Trial Advocacy—2000*, 74 TEMP. L. REV 1, 16 (2001) (recommending that trial attorneys "get on board" with display technology since its use in trials is quickly becoming "the norm"). Because they are "faster, easier, and less expensive," computer-generated visual aids provide advantages over chalkboards, flip charts, and posterboard. *Id.* at 18.

providing jurors with clear, legible, and professionally computer-generated visual aids in court.[112]

Law professors already understand the importance of computerized clarity and enhanced legibility in learning contexts outside the classroom. For example, professors would not expect students to read casebooks and law review articles that are written out in longhand using pen and paper, riddled with legibility concerns. Although having those materials professionally published makes them easier for the students to read, such computer-generated documents are not really necessary in order to teach the law. Students could read handwritten materials and still learn the law, but the point is that a potential lack of clarity due to illegibility (not to mention the lack of professionalism) should never be a problem when an easy solution exists.

Another simple analogy may be helpful. In a large classroom with many students, a microphone may be necessary in order to enhance a student's ability to hear what the professor is saying. It would seem absurd to suggest that a professor who uses a microphone (which is a form of technology) would be using an unnecessary modern classroom luxury. Instead, the microphone would be seen for what it is—a tool to enhance the professor's words so that they can be more easily heard and understood. But a word of caution: if the professor's manner of speaking is unintelligible to begin with, the microphone would only make that problem clearer to all. In short, if something is important enough to emphasize in a lecture or to write on a chalkboard during class, then it should be done in a manner that is as clear as possible. Display technology achieves this high degree of clarity.

Surely there is no pedagogical value in having students struggle with such an elementary issue as chalkboard penmanship in the classroom. I have yet to meet a professor, even the most Luddite,[113] who would argue that his or her own chalkboard handwriting is more legible than the text that could be generated by a computer. I have also yet to meet a professor who would argue that to be a good lawyer, students should be skilled in the fine art of deciphering poor chalkboard penmanship (with the possible exception of cross-examining a handwriting expert). Again, to analogize to the use of a microphone in a large classroom, it is ridiculous to argue that there is a pedagogical benefit in *not* using a

112. *See* Galves, *supra* note 12, at 186–93 (explaining the communicative value of using computer-generated visual aids in court); *see also* Bocchino, *supra* note 111, at 18 (explaining that "[t]rial lawyers have always known that visual aids and the displays of exhibits are important" and that "[a]ll that has changed is the medium"); Diana G. Ratcliff, *Using Trial Consultants, What Practitioners Need to Know*, 4 J. LEGAL ADVOC. & PRAC. 32, 46 (2002) (stating that "[w]ith respect to courtroom presentations, all sources agree that whether you are presenting your case to an arbitrator, a judge, or jury, well-crafted visuals are a must").

113. A "Luddite" is defined as: "1. Any of a group of British workers who between 1811 and 1816 rioted and destroyed laborsaving textile machinery in the belief that such machinery would diminish employment. 2. One who opposes technical or technological change." THE AMERICAN HERITAGE DICTIONARY OF THE ENGLISH LANGUAGE 1039 (4th ed. 2000).

microphone in class because it forces students to listen more carefully. It is also ludicrous to argue that a professor who uses a microphone in class to make it easier for students to hear is somehow coddling lazy law students. Allowing unnecessary legibility and clarity obstacles in class has nothing to do with legitimate academic rigor. In fact, allowing such obstacles in class actually detracts from intellectualism because it is nothing but an unnecessary distraction. It may also favor some students who manage to claim seats near the front of the class to see the chalkboard better than their counterparts in the back of the room.

b. What About New Material Raised in Class?

Display technology may be great for replacing the chalkboard when presenting *prepared* material, but a legitimate question arises as to whether the technology can be used to react to *new* material raised in class. Spontaneity in the classroom presents a special challenge for display technology. The technology must be flexible enough for the professor to expand upon the prepared materials.

First, such flexibility is not an issue regarding the material that the professor has prepared and can anticipate will be covered in class. Therefore, the computer should be used for at least all of the *anticipated* concepts to be covered in class.[114] If a professor is adequately prepared for class, the professor should be able to anticipate the vast majority of what questions may be asked or what issues may be raised.[115] Thus, flexibility and spontaneity are needed with respect to only a small minority of class issues that are unanticipated, but still worthy of class exploration.

Second, even when unanticipated yet noteworthy information arises during class, the computer can be used to transcribe and display it just as easily as writing such material on the chalkboard. Many computers have software that can turn the mouse into an "electronic pen" that allows a professor to highlight or emphasize existing text or drawings.[116] It also allows the professor to create new drawings in class, just like drawing on a chalkboard. That said, to the extent a professor can still write or draw more quickly and comfortably on the chalkboard than type or use an electronic pen, the professor should write the spontaneous material on

114. Thus, to the extent a professor can anticipate material, hypotheticals, questions, explanations, and so forth in his or her preparation for class, display technology should be used instead of the chalkboard based on the increased clarity and legibility rationale alone.

115. *See generally Ex Parte* McLeod, 841 So. 2d 260, 265 (Ala. 2001) (holding that the term "duties require" in the Fair Dismissal Act requires a professor to reasonably prepare for class); ASS'N OF AM. LAW SCHOOLS, 1998 HANDBOOK 89, 90 (1998) (urging professors to "prepare conscientiously for class").

116. The professor only needs to click on an icon and the mouse becomes an electronic pen allowing the professor to draw using the mouse. Also, if the class is equipped with a SMART Board, this process is even easier because lines can be drawn on the computer images using a stylus—a pen-like utensil—and different colors can be used for emphasis or identification.

the chalkboard. The chalkboard and the computer are not mutually exclusive means to communicate with students in the classroom. Professors should use whatever is most effective for them and their students. This maintains flexibility for those few issues worth exploring that are not anticipated by even the best-prepared professors. Of course, the legibility and clarity issues rear their ugly heads whenever a professor uses handwritten text or drawings on the chalkboard instead of clear, typewritten computer images. However, a counterargument is that using a variety of visual sources makes the classroom experience more interesting and less monotonous.

Finally, legibly writing on the chalkboard takes valuable class time, especially if there is much information to write or draw. Before using display technology, I attempted to solve the timing problem by coming to class twenty minutes early to write out or draw all of my diagrams, text, and class outline. Having done so, I could simply refer to the material already written on the board during class so as to avoid taking class time to write or draw. I also avoided feeling hurried in class because I did not have to take time to write legibly and avoid misspellings or other transcription errors. After class, I erased my work thinking I would remember it all and could simply recreate my elaborate chalkboard diagrams in later years. This process seemed overly laborious to keep up for every class over the rest of my teaching career. Display technology allowed me to store the drawings, diagrams, flowcharts, hypothetical questions, key text from cases, and rules and statutes as computer documents. They can be reused and revised in ensuing years.[117] Before turning to display technology, however, I experimented with distributing flowcharts and handouts before class. This solved some problems, but unfortunately created others.

c. Problems Associated with Handouts and Flowcharts

Writing on the chalkboard before class worked reasonably well, but I began to notice that students were coming to class early just to copy down everything that I was writing on the board. One day, as almost the entire class was in the classroom fifteen minutes early to copy down my notes on the board, I decided it would be more efficient to put all of the information into a prepared handout for every class. I did not want to continue having to write all the material on the board and then have the students copy everything before or during class.

117. Professors should revise their lecture notes and classroom presentations in successive years to stay current and fresh. But professors who fail to do so will fail regardless of whether they use display technology or not. Just as professors can simply regurgitate handwritten lecture notes from their faded yellow legal pads, so can professors regurgitate from computer-generated images. But, in both cases, the teaching failure is an underlying pedagogical problem, not a display technology-specific problem.

As a result, I began to store all of my notes and diagrams on a computer so that I would not lose them after each class. I then distributed this information in handouts before each class. Thinking the problem was solved, I soon began to overwhelm students with paper handouts of diagrams, flowcharts, decision trees, lists of analytical steps, and lists of hypothetical questions. However, I began to notice that students were becoming less engaged in class, even with all of the helpful diagrams and flowcharts I had so eagerly prepared for them. I realized that although I may have solved chalkboard problems, I had unwittingly caused an even larger pedagogical problem in the classroom.

A student once told me that my handouts were so helpful that it was not even necessary to come to class. Although, at the time, he meant to compliment the usefulness of the handouts, I failed to recognize the serious pedagogical implication of his observation until later. Eventually I realized I was making my role in class irrelevant. Perhaps this realization crystallized when I noticed a cartoon one day that first made me chuckle, but then gave me pause. The cartoon depicted an empty classroom where, at the podium, the professor has left a cassette player that is playing the professor's tape-recorded lecture. At the same time, all of the students likewise have left tape recorders at each of their seats in order to record the professor's tape-recorded lecture. The cartoon, of course, questions why the school is having a class at all when no live people are there to participate.

The problem with handouts and flowcharts is that they are complete, self-contained documents from the moment they are distributed. There is no layering or building of elements, such as by using the Socratic method to explore all of the contours of the response and then to confirm those answers in an interactive way. Much of the learning process is defeated if the answers, list of elements, methods of analysis, and key facts are already set forth by the professor in a handout. The problem was that students thought these professorial handouts were the ending point of class rather than the beginning catalysts for academic exploration, and it was entirely my fault for not pushing students beyond what was already contained in the handouts.

Display technology addresses this problem because no text or image need be displayed to the class until the professor is ready to have the class consider it. Moreover, students have to take notes instead of having the material reproduced for them.[118] Without handouts, students must become involved in class by considering the displayed images and text and then reconstituting that information on their own. There is a value in having the students ingest the material and then reformulate it in their

118. It is possible to hand out hard copies of all of the images presented in class, or perhaps post them on the Internet, but I have found that this tends to create the very student passivity that I am attempting to eliminate in the first place. *See* discussion *infra* Section IV.B.5.

own words.[119] For example, when relating a procedural timeline while explaining pleadings or discovery, the professor can build each element of the timeline during class and discuss each chronological step as the class proceeds. Most importantly, the professor can focus the class on the particular legal implications and strategic maneuvers of each step systematically. This is where the professor must push the students beyond the information displayed.

C. Law as a Second Language for Law Students

For the last five years during the summer months, I have taught in a special international program at the University of California, Davis School of Law entitled "Orientation in U.S.A. Law." This is a program where judges, attorneys, L.L.M. students, and other law students from foreign countries take an intensive four-week course covering various subjects of American law.[120] English is a second language for most of these foreign lawyers and students. These students have observed how much more information they are able to understand and obtain from my lectures given the added use of display technology. They state that they are able to overcome the language barrier much better because the verbal information I present is reinforced by computer images. This should not be surprising because it is easier to understand a foreign language when reading it while listening to it, rather than when merely listening to a native speaker.[121] Moreover, a verbal explanation in a foreign language may become clearer once a student simultaneously sees various conceptual diagrams. This is because there are now two chances for the student to understand the foreign message instead of just one.

Although English is the first language for most of my students during the regular academic year, the technical language of civil procedure, evidence, or other legal courses is not. Students have often

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119. *See* Laurel Currie Oates, *Beyond Communication: Writing as a Means of Learning*, 6 LEGAL WRITING 1, 9 (2000) (discussing the impact of writing on learning).

> A central claim of behaviorism is that learning occurs through practice. Thus, if writing is a way of practicing, then students who write should learn more than those who do not write, and the more writing students do, the more they should learn, or at least remember. For example, a student who takes notes on a particular text should remember more than a student who merely reads . . . .

Id. (citation omitted).

120. *See* University of California, Davis, Orientation in U.S.A. Law, *at* http://universityextension.ucdavis.edu/international/law/orientation.asp (last visited Mar. 31, 2005) (providing a complete description of the Orientation in U.S.A. Law Program and explaining that the program provides students the opportunity to gain a better understanding of the theories and practices of the U.S. legal system).

121. *See* Maxine Eskenazi, *Using Automatic Speech Processing for Foreign Language Pronunciation Tutoring: Some Issues and a Prototype*, 2 LANGUAGE, LEARNING & TECH. 62, 62 (Jan. 1999), *available at* http://llt.msu.edu/vol2num2/article3/ ("Below a certain level, even if grammar and vocabulary are completely correct, effective communication *cannot* take place without correct pronunciation because poor phonetics and prosody can distract the listener and impede comprehension of the message." (citation omitted)).

commented to me that legal courses, with their own unique rule structures, are "like a foreign language" to them. To the extent display technology is helpful to non-native English speakers in learning the law, it is similarly helpful to neophyte law students who are unfamiliar with the "foreign" language of the law. Thus, display technology can be instrumental in overcoming both the literal and the figurative language barriers in teaching law.

D. Using the Chalkboard and Handouts to Supplement Display Technology

There still can be a place for the use of a chalkboard or handouts in class to supplement display technology. Handouts are useful if the professor wants to impart technical information when there is no pedagogical reason to build the information slowly or progressively. Handouts also save time if there is no pedagogical reason to address each element of the information or if it simply summarizes material already taught. Finally, handouts and flowcharts send the message that students should be creating their own handouts or flowcharts to synthesize material already learned. In short, handouts and flowcharts are great reinforcement tools for students and professors.

Similarly, the chalkboard still can be useful to address unanticipated but noteworthy information. It can also be useful to emphasize a point or method of analysis during class or to compare something new with the on-screen computer image. It can be especially useful because the diagram or list of elements can be left on the board and referred to during the entire class instead of at only a particular point. For example, when teaching various aspects of hearsay in my Evidence class, I will draw a simple diagram on the board and refer to it at various times throughout the entire class period.[122] Trial attorneys will employ similar techniques during their opening statements or closing arguments so that the jury can view the exhibit throughout the entire opening statement or closing argument for emphasis. In the end, students appreciate the effort that goes into preparing the material through display technology. More importantly, demonstrating hard work, careful preparation, and clear communication in addition to the verbal questioning and explanations is a good academic example for law professors to provide for their students.

122. The diagram consists of a speaker who makes a statement to the witness, represented by an arrow to that witness who is now in court relating that statement to the jury, with an arrow to the jury to represent that the statement is being used to prove the truth of the matter asserted by the declarant. The diagram keeps witnesses separate from declarants and it helps to focus the discussion appropriately. Rather than continuously referring back to a PowerPoint diagram at various points in class, I can simply walk to the board and point to certain portions of the diagram as I am asking a question or making a point. For an example, see http://faculty.mcgeorge.edu/galves/radiostar/htm.

IV. CRITICISMS OF DISPLAY TECHNOLOGY IN THE CLASSROOM

To err is human. To really screw up, you need a computer.[123]

A. Surviving the Alleged "Technology Takeover" Threat

Before addressing the general critique that display technology will take over the classroom and transform legal education into a brave new world of teaching devoid of humanity but long on gadgetry,[124] it is worth examining how previous technological changes did *not* bring about the pedagogical revolutions that were feared. Instead, teachers have simply incorporated various technological tools into their teaching over the years. Historically, teaching with technology has not meant that technology has dominated the message. Of course, the medium can become the message if the professor does not use a new technological teaching tool appropriately or becomes so fascinated with the technology that the professor loses his true pedagogical purpose and focus in class. The good news is that display technology can help a professor to achieve certain teaching objectives inside or even outside of class, if used appropriately. Indeed, enhancing the ability to accomplish a particular objective is the essence of any good technological advancement.

Moreover, we need not fear new technology. For instance, consider a simple example of a technological advancement outside of the educational context, such as the automobile as an innovation in locomotion. Travelers can now travel further and faster by automobile than they can by bicycle. However, it is true that there are dangers posed by automobile travel that were not present, or as pronounced, with bicycle travel.[125] Riding a bicycle has not been completely replaced by automobile travel, but the invention of the automobile has certainly enhanced locomotion. It provides a great new option for the traveler—a tool to help accomplish the traveling objective—despite new and different associated risks. Compare this to the educational context: display technology may have some new associated risks and

123. Dan Vergano, *Computers: Scientific Friend or Foe?,* USA TODAY, Aug. 31, 2004, at 6D (reporting that computers can cause unforeseen research problems in science).

124. *See* David M. Becker, *Some Concerns About the Future of Legal Education*, 51 J. LEGAL EDUC. 469, 477–85 (2001) (critiquing the technology takeover threat in legal education); *see also* Robert H. Thames, "*Hey, Did You Get My E-Mail?" Reflections of a Retro-Grouch in the Computer Age of Legal Education*, 44 J. LEGAL EDUC. 233, 244–48 (1994) (criticizing the loss of the human element in teaching due to the growing overuse of computers).

125. For example, one might get into an automobile accident, especially if the automobile is not used properly, and such an accident often is more injurious as compared to someone who merely falls from a bike. But this risk of automobile accidents obviously has not been enough to make us as a society eschew the automobile altogether and instead elect to travel predominately by bicycle. We have decided that getting from Point A to Point B is often easier, faster, and better accomplished by automobile rather than by bicycle despite the increased risk of a much more serious accident. However, bicycling still provides certain advantages over driving in certain contexts, such as exercise, enjoyment, and even punctuality (if there is a traffic jam).

disadvantages, but if used properly, the advantages of display technology often outweigh any disadvantages or potential problems.

Technological inventions for the classroom do not fundamentally change education at its core. Technology typically advances new means to accomplish a basic goal—such as the automobile as an advancement in travel—so the use of display technology in the classroom should be an expected and welcome progression.[126]

1. Classroom Technology Takeover: "Famous Last Words"[127]

Technology in the classroom has been incorporated in teaching throughout the ages in various ways.[128] Cave drawings, for instance, served as the first predecessors of educational technology.[129] Visual communication alone appears to be the most effective way in which our earliest ancestors communicated. Of course, the major evolution in education technology after verbal communication and language were developed was the use of written language to spread and preserve the spoken word.[130] Despite the obvious benefits of books and the written word, these developments were met with initial resistance by some ancient teachers.[131] Today, we would not dream of written language and books as somehow being antithetical to learning and basic educational values. But for some time, they were considered as such.

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126. This is not to suggest that law professors who do not use display technology are necessarily slower-traveling, deficient "bicycle riders," while those who use display technology are necessarily faster-traveling, more proficient "automobile drivers." Automobile drivers, after all, may not know where they are going and may cause all kinds of havoc on the road, while a biker may not suffer from any such problem because she knows exactly where she is going and can get there quite effectively. The overall thesis of this Article is that display technology is a tool that can be helpful, if used appropriately. Of course, even a good tool in the hands of a fool (a bad teacher, for our purposes) is ineffectual at best, and harmful at worst.

127. Not only are there often apocalyptic predictions that somehow do not come true, as I will argue with respect to the apparent fear that there will be a "technology takeover" in teaching, but there are also wonderful understatements that likewise prove to be famous last words with respect to computer technology, as history inexorably proves them wrong. For example, note the following predictions from supposed experts: "I think there is a world market for maybe five computers." MICHAEL ARKFELD, THE DIGITAL PRACTICE OF LAW 1–5 (5th ed. 2001) (quoting Thomas Watson, chairman of IBM, 1943). "I can assure you that data processing is a fad that won't last out the year." *Id.* (quoting the editor in charge of business books at Prentice Hall, 1957). "But what . . . is [the microchip] good for?" *Id.* (quoting an engineer at the Advanced Computing Systems Division of IBM, 1968). "There is no reason why anyone would want a computer in his or her home." *Id.* (quoting Ken Olson, president, chairman and founder of Digital Equipment Corp., 1977). "640K ought to be enough for anybody." *Id.* (Bill Gates, co-founder of Microsoft Corporation, 1981).

128. "Traditionally, technology has been defined as the application of science to the improvement of the human condition. Pure science seeks knowledge for its own sake; technology seeks to apply science to practical human endeavors for the benefit of people." JAMES E. EISELE & MARY ELLIN EISELE, EDUCATIONAL TECHNOLOGY: A PLANNING AND RESOURCE GUIDE SUPPORTING CURRICULUM 3 (1990); *see also* CUBAN, *supra* note 59, at 4 (noting that classroom technology is "any device available to teachers for use in instructing students in a more efficient and stimulating manner than the sole use of the teacher's voice").

129. *See* EISELE & EISELE, *supra* note 128, at 13 (acknowledging that cave drawings were the genesis of technology in education).

130. *Id.* at 14 (recognizing that the "invention of the Gutenberg printing machine . . . with the

At the beginning of the twentieth century, classroom learning began to incorporate other technological innovations. Those innovations did not overtake and replace traditional teaching functions, despite apocalyptic warnings. For example, in 1913, referring to the invention of film, Thomas Edison predicted that "[b]ooks will soon be obsolete in the schools."[132] But cost, access, unreliable projectors, and hardware problems limited the use of film in education.[133] Even after these basic hardware and facility problems were solved, films still did not replace the teacher. This is because a teacher is live in the classroom and can engage in "real time" with students by reacting to students' comments or questions. Good teachers may have realized the potential for using films in class for certain situations, but films did not "take over" the way it was once feared that they would. Fortunately, most teachers are not so lazy that they allow their vital teaching role to be replaced by a book or an instructional film.

Similarly, radio did not replace the teacher, even though a nationally renowned professor could conceivably broadcast to thousands of students across the country simultaneously. In 1932, Benjamin Darrow made this confident statement about the use of radio in the classroom:

> The central and dominant aim of education by radio is to bring the world to the classroom, to make universally available the services of the finest teachers, the inspiration of the greatest leaders . . . and unfolding world events, which through the radio may come as a vibrant and challenging textbook of the air.[134]

But radio would have a similar fate as film. Interestingly, many of the arguments favoring radio's use resemble today's arguments surrounding the use of the Internet and distance education.[135] In the end, radio did not replace the teacher in the classroom, "take over" classroom education, or reduce the classroom professor to a mere technician simply turning the radio transmission on and off for students.

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subsequent wide availability of books altered the nature of education so dramatically that its effect is still felt today").

131. For example, Socrates warned that written language would produce forgetfulness. *See* Ashby, *supra* note 4, at 360. Additionally, "[i]n the reign of Asoka, writing was widely used for administrative purposes but it was rejected for the transmission of sacred literature: passages from the sacred books had to be communicated by mouth and learnt by heart, not read." *Id.* at 359–61.

132. CUBAN, *supra* note 59, at 11.

133. *Id.* at 12, 18.

134. *Id.* at 19.

135. *See generally* Robin Peek, *A Distance Learning Reality Check*, INFO. TODAY, Feb. 2000, at 30 (suggesting that "distance education still has many hurdles to overcome if it does indeed become a common form of educational delivery"). The distance learning debate is beyond the scope of this Article. In short, there are advantages to distance learning, such as time and convenience for students, better and more reliable technology that makes interaction seamless, and access to professors that would otherwise be impossible. But there are also disadvantages, such as a lack of direct contact. Regardless of how one may feel about the issue, for purposes of this Article, display technology would be helpful for all of the reasons stated herein, in either a live classroom teaching context or an online distance learning context.

Finally, consider the use of instructional television in the classroom and the great expectation of change given the significant investment of money in this pedagogical approach.[136] Although some predicted that television would "take over" as well, "[i]nstructional television occupies a tiny niche of the school day for the teachers who use it . . . [and] has been and continues to be used as an accessory to rather than the primary vehicle for basic instruction."[137] Again, the professor's critical role in the classroom survived the perceived threat from the new technology.

These examples of various technologies that never quite replaced the teacher serve to underscore the undeniable fact that teaching consists of much more than presenting information for student consumption. At its core, teaching involves the intellectual interaction between student and professor, as well as the joint academic exploration of material by students with other students. Those things together make education vibrant and valuable, which is far beyond the simple act of technologically enhanced information transfer.

2. History Will Most Likely Repeat Itself

These technological advancements, coupled with their limited use in the classroom, demonstrate that the prediction of a technological "takeover" is often exaggerated. The teacher has maintained a prominent role in the classroom regardless of the advent of options to help communicate and facilitate learning through various technological mediums.[138] So, the dire predictions of the "scourge" of PowerPoint[139] and other obtrusive classroom technology will most likely fade.

Thus, law professors need not fear, because they will remain relevant in the classroom regardless of their use of display technology. If

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136. *See* EISELE & EISELE, *supra* note 128, at 14. In 1962, Congress underwrote the initial use of educational television in schools and colleges by providing $32 million to develop classroom television programs; by 1971, over $100 million had been spent by public and private sources. CUBAN, *supra* note 59, at 27–28.

137. CUBAN, *supra* note 59, at 49 (stating that "[o]nly a small band of teachers use the medium willingly, consistently, and with enthusiasm" and "[t]eacher use of television, while slight overall, is substantially greater in elementary than in secondary schools").

138. *See generally* CUBAN, *supra* note 59, at 51.

139. The criticism of PowerPoint display technology is visceral, vehement, and just plain nasty. *See* CLIFFORD STOLL, HIGH-TECH HERETIC, 179–84 (1999) (devoting a whole chapter to *The Plague of PowerPoint*); John Schwartz, *The Level of Discourse Continues to Slide*, N.Y. TIMES, Sept. 28, 2003, § 4, at 12; Thomas A. Stewart, *Ban It Now! Friends Don't Let Friends Use PowerPoint*, FORTUNE, Feb. 5, 2001, at 210; Edward Tufte, *Power Corrupts. Powerpoint Corrupts Absolutely*, WIRED, Sept. 2003, at 118; Art Jahnke, *Is PowerPoint Too Dumb for Words?*, DARWINMAG.COM, *at* http://www.darwinmag.com/connect/opinion/column.html?ArticleID=117 (June 18, 2001); Julia Keller, *Is PowerPoint the Devil?*, SILICONVALLEY.COM, *at* http://www.siliconvalley.com/mld/siliconvalley/5004120.htm (Jan. 22, 2003); *Does PowerPoint Make Us Stupid?*, CNN.COM, http://www.cnn.com/2003/TECH/ptech/12/30/byrne.powerpoint.ap/ (Dec. 30, 2003). One can only wonder if these critics would assail teachers who use the chalkboard the same way they do those who use PowerPoint. Mrs. Garret, my fifth grade teacher at Beulah Heights Elementary School and one of my teaching role models, was awesome when she used the chalkboard in class; she probably had no idea what a devil of a future law professor she was helping to create.

a professor does use display technology, it will be up to that professor, not the technology, to make the professor's teaching sufficiently interactive for the students. Therefore, display technology is just the next evolutionary development in classroom technology that gives teachers another tool to communicate with their students. Notwithstanding this argument, there still exist some pedagogical concerns and criticisms worth exploring that regard the correct or optimal usage of display technology in the classroom.

B. The Five Rhetorical Questions Answered

1. Display Technology as an Oversimplification of the Classroom Experience

Does display technology oversimplify the classroom experience in order to connect with today's students who, with extensive experience in receiving visual stimuli, have suffered an unfortunate decrease in their attention spans and in their ability to think critically? This "dumbing down" charge is a valid criticism if the professor uses display technology as nothing more than an in-class teleprompter in order to reduce the profundity of legal problems to a boring reading of simplified text and bullet points. To reduce the classroom experience to listing gross generalizations of legal doctrine and simple checklists of information makes a mockery of class and the rich teaching traditions of legal training. If a professor poses a question, but merely states the answer and moves on without allowing students to grapple with it, the students will neither be challenged intellectually nor develop meaningful analytical skills.

a. Don't Shoot the Messenger

This "dumbing down" criticism is really a direct function of bad pedagogy in the first place. Bad pedagogy can be accomplished by using any number of information delivery techniques, technology or no technology. Whether a professor reads from handwritten lecture notes, uses fancy display technology images, or uses nothing at all and simply recites from rote memory, the lack of intellectual challenge for students and the lack of analytical skills development is the same. Thus, the use of display technology is not responsible for oversimplifying a class; instead, the blame for such a problem should rest solely with the professor. Nothing intrinsic about display technology dumbs down a class more than the act of reading from a casebook or reciting doctrine from memory. Indeed, a chalkboard also does not necessarily dumb down a class. Thus, it all depends upon *how* such information transfer

techniques are used in class by the one who has the ultimate teaching responsibility—the professor.

The use of display technology probably receives criticism because, if a professor is engaging in oversimplification in the first place, display technology makes that professor's pedagogical failure much more apparent. Indeed, because display technology is so effective at what it does—clearly delivering the professor's message—when that simplistic message is presented in a passive way, critics often will shoot the "messenger" (the display technology) when the message is to blame. Display technology should not be held responsible in a guilt-by-association manner just because it is a very effective messenger of what may be an overly simplistic message from a boring teacher.

Recalling the earlier microphone example, when a professor uses a microphone in class so that students can hear well but then proceeds to oversimplify the presented material, it is foolish to argue that the oversimplification by the professor is the fault of the microphone. In this example, it is easy to see how the oversimplification in class has everything to do with the professor's bad teaching and nothing to do with the microphone. However, when it comes to display technology, the critics are thrown off track even though the principle at hand should be the same: do not blame the technology for merely amplifying the professor's message. When the technological medium that amplifies the professor's words is visual, it receives the oversimplification critique; but when it is audible, everyone seems to understand that it would be rather silly to blame the use of a microphone for the professor's oversimplification.

b. Too Much of a Good Thing?

One pedagogical goal of a professor should be to explain, clarify, and simplify complex material in order to make it accessible to students.[140] However, there is a risk of "overkill." If *all* a professor does in class is simplify the complex and make legal intricacies more accessible in a passive way, then display technology will help a professor achieve that pedestrian goal. For example, just as a knife is a great tool to prepare food, its properties also allow it to be used improperly as a weapon to commit a violent crime. Unfortunately, a professor who already has a tendency to oversimplify his or her classes might be drawn to display technology as a tool that can help achieve that limited objective in class, but do so in a graphic and vivid way.

If a professor is lazy in her pedagogy, she might decide to hide behind display technology, thinking that it will enliven an otherwise

140. *See generally* Arthur W. Chickering & Zelda F. Gamson, Seven Principles for Good Practice in Undergraduate Education, *at* http://honolulu.hawaii.edu/intranet/committees/FacDevCom/guidebk/teachtip/7princip.htm (last visited Mar. 31, 2005).

boring class presentation. Whiz–bang graphics might make an initial splash as something new and different. However, modern law students are already familiar with display technology, so they will not be overly impressed with the graphics if the message behind them is weak. If a professor is oversimplifying a class, law students will realize that display technology is not going to cure the professor's teaching deficiencies; it will only make it more apparent just how bad she is as a teacher.

c. When to Simplify

Although display technology is not synonymous with simplification, it can be used for several valuable purposes: to list analytical steps or elements of a cause of action; to categorize logical connections between analytical steps and relevant facts of a case or hypothetical; or to show a diagram that helps separate important analytical steps in a complicated analysis.[141] But once that is done and the foundations for learning are laid, the actual legal analysis must begin. A professor must draw out students and push them to be precise in their analysis. Students must learn to focus on the particular element of the cause of action they are attempting to explain, and what logical connections they are attempting to make. Technology can help a professor to teach these skills, but the true essence of teaching must come from the professor himself.

Display technology should be used not only to relay text and words, but also to visually conceptualize legal problems and issues through pictures and diagrams. Legal concepts should be conveyed through verbal as well as nonverbal means, such as diagrams, drawings, and even photos. Visual technology is helpful because sometimes conceptual diagrams can be used to convey a difficult legal issue.

For example, students in my Evidence class may not grasp how a witness's former convictions may be used as character evidence to impeach the witness's credibility. They have a difficult time understanding the overlap between "character" and "credibility," which is the foundation of Federal Rules of Evidence 608 and 609. Rather than just expressing the overlap verbally or even textually in simple bullet-point form, I use a Venn diagram of two overlapping circles—one circle represents character and the other represents credibility.[142] This helps students to parse out the overlapping constituent elements of these concepts. I can refer to different areas of the diagram and ask students to construct examples of a pure character attack that does not involve credibility, or a pure credibility attack not involving character. I can then point to the overlapping area of the diagram for a simultaneous attack on credibility and character. Finally, I can get to the difficult issue of why, for example, a witness's former felony conviction for assault has anything

141. *See supra* notes 65–70 and accompanying text.
142. For an example, see http://faculty.mcgeorge.edu/galves/radiostar.htm.

to do with his character for truthfulness.[143] In this regard, the visual technology does not oversimplify these legal concepts; instead, it clarifies concepts visually so that students can understand them and focus on applying the elements in a logical, organized, and more meaningful way.

While such diagrams can simplify the complex, the reason to do this in class is to make the legal concepts more analytically accessible to students. This is not to gloss over the inherent academic complexity, because that would be an instance of oversimplification. Rather, it is to make the legally complex more readily accessible to students so that they can ingest and then apply the concepts. If critics believe that assisting students to access complex information is not a worthwhile pedagogical goal, then they are naturally going to believe that *any* simplification necessarily qualifies as undesirable oversimplification. Simplifying concepts to promote understanding is not a bad thing. While it may stroke the professor's ego if a student says, "That professor is so smart I cannot even understand her," that should not make professors feel confident that they are successfully teaching and intellectually connecting with such a student.

d. Simplicity of Verbal–Only Communication

Critics who charge that the use of display technology promotes the oversimplification of material would probably reject the same overinclusive logic if it were reversed and applied to verbal–only communication. If a pro-technology critic stated that all professors who do not use display technology are necessarily overcomplicating all of their subjects, the anti-display technology critics would probably reject the argument and defend by saying that it really depends on *how* the professor teaches. Is the professor clear and cogent with her articulations in class, or is she confusing, rambling, and unintelligible? The latter critics would defend verbal speech and discussion by saying that it is not the use of words in and of itself as a form of communication that is the cause of any confusion; instead, the professor's inappropriate use of words would solely be at fault. Accordingly, it is just as wrong to argue that a professor is *necessarily* oversimplifying by using display technology as it is to say that a professor is *necessarily* overly complex when using words alone.

e. Focusing on the Real Problem

Display technology simply amplifies whatever the professor is doing pedagogically in class, good or bad. Critics focus solely on how an

143. This is an assumption that law-breakers do not respect the law and, therefore, will not respect the duty to tell the truth in court. *See* FED. R. EVID. 609 (concerning impeachment by evidence of a prior criminal conviction).

already bad professor may be made worse by using display technology, while cheerleaders for display technology focus solely on how a good professor may be made even better by using display technology. Admittedly, I am focusing on the latter, because I encourage good professors to be better. But, even the cheerleader in me will caution that if a professor is sub-par, that professor first needs to focus on improving basic pedagogy. Until that issue is satisfactorily addressed, display technology will not help that professor and will probably serve only to make any existing teaching problems worse for students.

2. Display Technology and Intellectual Spontaneity

Does display technology stifle intellectual spontaneity by shutting down a student's, and even the professor's, desire to explore unpredictable tangents during class? This is a valid criticism if professors become so enraptured with display technology that they become inflexible in class and will only "stick to the script" in order to cover all of the prepared material in the presentation. If that is the case, class becomes boring, as there will be little student participation and no intellectual growth through academic exploration. It is like having to listen to a speech that is simply read to the audience from a prepared text versus listening to a speech given by someone who is speaking to the audience from the heart in a natural conversational tone, and perhaps even allows questions from the audience. Students do not want to be read to in class, as they can read faster to themselves. If a professor uses display technology as an inflexible teleprompter and nothing else, then the professor loses all spontaneity and fails to ascertain if the class does or does not understand the material. So, learning opportunities to explore student-initiated tangents and to intellectually engage and interact with the professor are lost if the professor slavishly follows an inflexible agenda.

Again, this criticism can just as easily be made about professors who do not use display technology but simply follow their own rigid class agenda and refuse to deviate from what they already have prepared. However, this type of professor is not a new problem. Although display technology can be used in a similarly rigid manner, there is the same causation or correlation issue: the actual cause of the inflexibility and the overall root problem is the professor, not the technology.[144] I suppose that display technology can be used as nothing more than a simultaneous

144. Just as display technology does not cause poor teaching, neither does the Super Bowl cause the stock market to turn, despite the following interesting correlation: For the last eight years, when an American Football Conference team wins the Super Bowl, the stock market goes down; but when a National Football Conference team wins, the stock market goes up. *See* John Wordock, *Stock Market Needs Tampa to Win*, CBSNEWS.COM, *at* http://www.cbsnews.com/stories/2003/01/24/superbowl/main537850.shtml (Jan. 24, 2003). Despite these facts, it would be silly to argue that there is an actual causal nexus between the two events.

sharing of the professor's class notes with the entire class, as the professor considers the issues contained therein, but that does not solve the inflexibility problem. Whether the notes are displayed with technology or read by the professor, this method stifles spontaneity.

a. Resisting the Temptation to Remain Wedded to the Prepared Message

A professor who spends a lot of time preparing display images may become invested in presenting the material in the same order in which it was prepared. But this investment in the material should not control the professor's exploration of the subject matter. Professors need to remain flexible enough to change their scripts. This is true regardless of whether one uses display technology, because a professor may now be as wedded to display technology images as he or she once was to handwritten notes.

However, display technology still might make classroom spontaneity a bit more of a challenge for a professor. Using display technology requires the professor to put a lot of time and effort into preparing the visual diagrams and text and thinking about the precise order in which the class should consider the relevant material. Naturally, the professor using display technology might find it more difficult to deviate from his preparation because he may be more invested in his presentation and the order in which he has developed the material.[145]

Strategic decisions must be made with the best interests of the class in mind. When these interests conflict, the professor must make a judgment call. A professor may subconsciously be more reluctant to deviate from an elaborately prepared set of display technology images than from a handwritten or typed class outline. He may have a harder time changing the order of issues to be discussed with display technology because the computer images must be rearranged on the spot for all to see, while he can more easily move around to different parts of his written outline or class notes inconspicuously.

Thus, although all professors need to be careful in this regard, professors using display technology need to be extra careful to resist the temptation to remain wedded to their prepared material. They need to feel free and confident enough to skip prepared material or to change the order of presentation if that makes logical sense given the course of class discussion, or even to stop with the prepared material entirely in order to address questions that may arise. Much of the judgment and skill necessary to make good teaching decisions about class direction comes with experience. More experienced professors are able to deviate from

145. An analogy from practice is helpful here: A lawyer taking a deposition must make a strategic decision between immediately exploring a tangent raised by the deponent, or continuing to follow the prepared order and addressing the tangent at a later, more appropriate time (if at all). So, too, must a professor make a strategic decision in class about whether to explore an interesting tangent or to strictly follow the lesson plans.

their scripts because they have developed the confidence necessary to make such a strategic decision.

A professor should consider display technology as simply a method for laying out a series of beginning catalysts for academic exploration, and not as the ending points of class in and of themselves. For example, at the end of a section, a professor could say, "So, we have learned from the cases that the five elements of a prima facie tort case are . . . ," and then use display technology to set forth those elements: "(1) duty; (2) breach of that duty; (3) causation; (4) damages; and (5) plaintiff's conduct." Alternatively, if the professor is briefing students at the beginning of class on what main issues were covered in the last class, she can say, "Last time, we considered the requirements for lay opinion testimony, which were that it be: (1) rationally based on the witness's perception; and (2) actually 'helpful to the jury.'" From there, the elements can be explained further, expanded, or posed to students as a hypothetical by using display technology. But foundational material is not going to change, regardless of what happens during class, because the text of the rules, statutes, provisions, or cases does not change. Just because a professor is prepared and can direct a class and keep it focused does not mean she is being inflexible or so tied to her notes or display images that she lacks the ability to deviate when necessary. Still, professors using display technology should be cognizant of the possible downside of being wedded to the prepared displays and be careful to avoid it.

b. Display Technology as a Crutch

Some professors, especially new ones, might be nervous about conducting a law class, concerned that they may come to a point where they do not have anything insightful to say to the students.[146] Display technology might seem like a helpful remedy because if the professor gets stuck or lost, he at least will have something to say since he can always just read from or comment on the slide show. Unfortunately, this is not a good way to use display technology. If display technology is reduced to a mere crutch for the professor who is unsure or even forgets how to conduct class, or uses display technology to rebuff tough questions because he has the excuse that the class needs to get through the material, then display technology is being used inappropriately.

In fact, it is poor teaching form to use anything in class as merely a crutch. Asking students endless questions about the facts of a case may be used as a crutch if the professor has mastered the factual details but

146. The "Ask the Teacher Archives" of the "Teacher Connection" are full of several journal entries describing the frustrations, nervousness, and problems that new teachers face. Phi Delta Kappa International, Ask the Teacher Archives, *at* http://www.pdkintl.org/tconnect/archask.htm (last modified Dec. 15, 2004).

does not know how to teach the application of the legal principles to other situations. Such a possibility does not mean the Socratic method is an ineffective teaching method, only that it is being used inappropriately. Although display technology can be used as a crutch, it is not necessarily always one. Professors need to make sure that they are using display technology in the appropriate manner.

c. Resisting the Temptation to Overindulge a Tangent

Although professors need to make sure they remain spontaneous and flexible in class, spontaneity has its dark side as well. Some professors can become so enraptured with the vast ocean of interesting legal and theoretical issues swirling around in a case that the class degenerates into a free-for-all of random legal discussions, which the students are supposed to somehow follow, organize, and comprehend. Students obviously should have practice in making sense out of all of the interesting tangents that are raised in class. In fact, that is one of the frustrating but exhilarating experiences students have during law school. But the professor needs to exercise at least some control over the discussion, otherwise the class can become a disjointed orgy of ideas.

Display technology has the advantage of forcing such professors to focus on what they hope to accomplish for each particular class. It requires a professor to take more responsibility for what is going on in class because the professor must produce something tangible prior to each class session for the students to see. Display technology may help this problem, but the correct diagnosis of root pedagogical problems needs to be made in the first instance. For professors who are scattered, using display technology can help them to focus; but for professors who lack spontaneity and flexibility in class, display technology may only exacerbate their problem with rigidity. Professors interested in using display technology should do a thorough self-assessment to see where they lie on this continuum to be aware of how best to adapt display technology to their own teaching.

d. Intellectual Spontaneity and Exploration of Legal Issues

Some legal complexities do not have clear answers, and professors often use class time to explore the gaps, conflicts, and ambiguities in legal rules or doctrine. But sometimes legal questions *do* have definitive answers. If a professor diagrams the facts of a case using display technology and then a student correctly states the case in accordance with those images, it graphically reinforces that student's positive performance in class. This reinforcement validates the student while also keeping the rest of the class informed as to what is most important about the case. It also cues the rest of class to the portions of the student's comments that are lacking, inconsequential, or just plain wrong.

It also means that if the professor is wrong about a certain aspect of the case, has forgotten an important point, or has overemphasized a point, then the professor is now "on the record" in front of the whole class. But this opportunity for embarrassment should not be a reason for professors to fear using display technology. If a professor expects vulnerability of her students as she asks them tough questions, then she should be willing to put her ego on the line as well. After all, professors should not shy away from *mutual* high expectations, but should be willing to "practice what they preach." That can be scary, but it is also honest and academically challenging for both students and professors.

3. Class as a Mere Showcase for Technology Instead of Learning

Does class become a showcase for technology instead of a real learning experience when a professor uses display technology? This is a valid criticism if a professor becomes so taken with the technological bells and whistles that the intellectual exchange gets lost in all of the unnecessary whiz–bang graphics. Display technology can become so distracting that class is reduced to an endurance contest of images, sound effects, and bullet points instead of an intellectual experience where incisive ideas are exchanged and sharp legal analysis is honed.

The antidote to this problem is really quite simple: there needs to be a pedagogical, not a technological, reason for using display technology. If there is none, then computer images should not be used merely as a showcase for what can be done technologically. Other basic analogies are helpful here. In-class humor can be an effective teaching method, but gratuitous jokes that serve no pedagogical purpose other than to entertain or to let out the professor's inner-comedian end up wasting the students' valuable learning time. Likewise, asking a series of irrelevant questions about certain picayune facts of a case serves no pedagogical purpose other than to impress students with what a good memory the professor has. Examples such as these are legion and demonstrate that bad teaching judgment—not humor, "war stories," or excessive factual questioning—is the culprit.

Professors using display technology should avoid falling victim to this kind of pedagogical mistake. With every sound effect and every displayed textual passage or conceptual diagram, the professor should ask, "Is this display valuable in helping get the point across?" The standard for admission should be whether the image is pedagogically worthwhile—does the learning/retention upside outweigh the distraction/waste-of-time downside? To help in this balancing test, the professor should ask, "What difference would it make if I did not use the visual image in class?" If the answer to this question is "none," then the professor should not use the visual image in class. It would waste time and represent a significant pedagogical opportunity cost.

This balancing test determination is akin to the advice or feedback often given to students who turn in written projects for class. For example, I will ask students in my classes to make sure that, as they write, they are satisfied that each paragraph has a definite purpose and helps further their overall analysis. The same is true for every sentence, every phrase, and even every word. If any paragraph, sentence, or word fails to serve the overall objective of the writing assignment, then it is a waste of time, a distraction to the reader, and should not be used.[147]

The same kind of balancing test is necessary for a professor using display technology. Display technology can be used either as an effective communication delivery system for substantive ideas or as a mere showcase for technology. In the latter case, the medium becomes the message and the substance of the ideas conveyed is a secondary, shallow, or even nonexistent goal. But, if the professor has an articulable pedagogical reason for showing the text or diagram in class, the use of display technology is justified.

4. The Loss of Good Classroom Dynamics and Socratic Dialogue

Do the classroom dynamics of a good Socratic give-and-take dialogue suffer due to the professor's inflexible class agenda where the expected answer is already displayed, or just about to appear, on the screen? This is a valid criticism if the professor ceases to engage students by asking tough questions and demanding precise answers. If the professor merely asks and answers all of his own questions and hypothetical scenarios while students just watch and listen, then students are being cheated. Such a professor is merely going through the motions of the class and is presenting information without concern for whether students are actually learning anything from the presentation.

However, professors who become automatons do not require display technology to disengage from their students.[148] If such a professor does use display technology, the passive presentation may make it even clearer to the students that the professor is just going through the motions. Again, the disengaged professor is to blame, not the display technology.

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147. Just because it is possible for a student to write a legal brief or memorandum using flowery, unnecessary language, it does not mean that the writing assignment itself is only a showcase for such superfluous writing. It simply means that written words can and should be used to march through a legal analysis in a helpful way instead of merely "showing off" an ability to turn a witty phrase using unnecessary, marginally entertaining language, and thereby losing sight of the objective of the brief or memorandum.

148. Catherine Arcabascio, *The Use of Video-Conferencing Technology in Legal Education: A Practical Guide*, 6 VA. J.L. & TECH. 5, ¶ 61–62 (Spring 2001), *at* http://www.vjolt.net/vol6/issue1/v6i1a05-Arcabascio.html (arguing that poor teaching styles will only be exacerbated by using technology because if a professor cannot properly facilitate a class discussion, then technology will only be one more thing to juggle).

a. Does Display Technology Tend to Make Good Professors Go Bad?

Professors must resist the ease and efficiency of presenting material using display technology if they are not also intellectually engaging with students during class. This is especially true if the professor gets behind in her course coverage. Such a professor might ponder, "Why spend a great deal of class time asking students a series of long, drawn-out Socratic questions when I can easily click through a prepackaged presentation and cover the material more quickly?" The problem is that a true learning experience for students is lost when Socratic engagement is sacrificed for time and coverage concerns.

But professors who do not use display technology are not immune from falling behind on their syllabi and sacrificing the Socratic method to catch up. Professors may use display technology as a shortcut, but they may also use the shortcut of simply doing straight lecturing instead of Socratic questioning. The real criticism here is of professors who take shortcuts that sacrifice the Socratic method, either by using display technology or by lecturing through material in order to explain the law to students instead of fully discussing it and exploring it with them. All professors should be cognizant of the quality time it takes to explore information with students and to engage in the Socratic method of teaching.

If a professor's display technology agenda becomes so filled up with information the professor is just itching to present, then there may be no class time left to engage with students. But technology or no technology, a professor must not get so excited to share knowledge with the class that he forgets to allow the students the opportunity to discuss and defend their positions in class.

To the extent that some portion of class should be used to impart, emphasize, or reinforce critical information and not just ask Socratic questions, display technology can help. The technology can keep a professor organized instead of going off on tangents and possibly falling behind on the syllabus. Using display technology this way eliminates the pressure to hurry through material without being slowed down by the all-important Socratic engagement of students in class.

Falling behind is an issue regardless of whether one uses display technology. Professors who would never get behind or never take a shortcut to catch up would not necessarily do so simply because they adopt display technology. If anything, display technology has the capacity to make professors more efficient in their class coverage. All professors must employ enough pedagogical discipline not to fall behind in the first place; but if they do fall behind, they should not compound the problem by taking an unfortunate shortcut—either by clicking through a display technology presentation or by doing straight lecturing—to impart information to a passive student audience.

It can be tempting for some professors to tell students, "Let's just skip the Socratic routine and I will tell you what this case is about, what it means, and how it should be applied in slightly different situations in the future." But just because a professor *can* do that does not mean she *should* take the easy way out and shortchange the students an opportunity to engage in class. We expect professors to teach responsibly and work with students in class even though the professors can always just explain the answers themselves. This was true before display technology was invented, so it should not be a surprise that it is still true when display technology is employed.

b. The Inability to Predict Exactly How a Student Will Answer

One limitation on the use of display technology is the professor's inability to predict *exactly* how a student will answer a posed question. Normally, a follow-up question is asked in reaction to a student's answer. After the first question, display technology cannot really sharpen the student's answer because the professor could not have anticipated a reactionary question to include in his display. Those follow-up questions must be crafted on the spot to the precise language used by the student. The professor who uses display technology could do some alternative preparation to remedy this problem. He could display an outline of the necessary considerations during the questioning process, assuming he has a goal in asking Socratic questions in the first place. Slight variations to the hypothetical could also be displayed as the questioning progresses. This allows students to be clear about the beginning and changing assumptions being made. A list of important considerations can also be displayed after the Socratic questioning is completed. The bottom line is that law professors using display technology must not forget their important Socratic function while teaching, otherwise class will be reduced to mere information transfer.

The deposition analogy from practice is once again useful here. One of the main advantages of taking a deposition over submitting interrogatories as a discovery device is that the attorney can ask follow-up questions in a deposition.[149] It allows the attorney to probe and investigate to a degree that cannot be accomplished with interrogatories prepared beforehand. These are the kind of questions that cannot be anticipated because they necessarily depend on the exact language the deponent used to answer the previous question. The longer the deposition proceeds, the longer the attorney has to develop strategic, reactionary questions for the deponent. But this does not mean that at least some difficult, pointed questions cannot be anticipated.

149. Mark D. McCurdy, *Obtaining Admissions in Depositions*, 74 TEMP. L. REV. 139–40 (2001) (noting the dangers of not using open-ended and follow-up questions in order to probe into unknown areas during depositions); *see also* DAVID M. MALONE & PETER T. HOFFMAN, THE EFFECTIVE

5. Display Technology as Passive "Electronic Spoon-Feeding" Lacking Analytical Substance

Is using display technology simply "electronic spoon-feeding," where the professor is reduced to a boring "information-giver" shoveling out legal information through slides, while the students become inactive "information-receivers" who copy the images without developing analytical skills in the process? This might be the most common critique of using display technology. In "The Plague of PowerPoint," a chapter in *High Tech Heretic*, a critique on the use of computers in the classroom, the author states:

> In public speaking, PowerPoint is the coward's choice.
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> . . . .
>
> [It produces] a predictable, pre-programmed, pre-produced lecture, devoid of any human content. The audience might as well watch a videotape.
>
> . . . .
>
> What motivates an audience? Emotion. Passion. Fire. A sense of warmth, excitement, shared adventure. A PowerPoint-driven meeting delivers chilly, pre-programmed video graphics. You see graphs, numbers, and bullet charts. But dancing sprites and flashing logos can't inspire zeal, loyalty, outrage, or a clarion call to action.[150]

This is a valid criticism if the professor believes the function of class is simply to provide the students with nothing more than information. Such a class is boring and is also a very inefficient way to transfer meaningful information. It would be much more efficient for the professor to have the students simply read the PowerPoint slides for themselves instead of having the images read to them by the professor in a classroom setting. Indeed, when a professor simply wants the class to ingest written information, the professor typically assigns readings in appropriate casebooks that the students can read on their own, rather than using valuable class time for the professor to read to the students.

But again, notice how this criticism can just as easily be leveled at professors who do not use display technology at all, but simply read from their notes or other prepared materials during class. The problem is the professor's decision to read rather than to engage, not whether the professor reads from computer images on a screen or from written notes. Professors who actively engage students intellectually can do so with or without display technology. So, the use of display technology does not itself *force* a professor to spoon-feed information to passive students, just as the use of books in class does not *force* a professor to read long

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DEPOSITION: TECHNIQUES AND STRATEGIES THAT WORK 29–34 (2d ed. 2001) (examining the advantages of using depositions as a discovery device).

150. STOLL, supra note 139, at 180–81.

passages of text to students in class instead of actively engaging with them.

This is not to say that key text from cases, rules, statutes, and constitutional provisions should not be read aloud to the class at times. This can be appropriate, especially when the professor is evaluating the precise legal language of critical text. But the focus on precise language should be the initial launching pad for the professor and students to engage in an academic exploration of the text, its legal implications, and the related consequences. This academic exploration can be conducted more easily using display technology when the textual foundation is clear for all to see, the hypothetical assumptions are laid out, and the class is parsing the same textual phrases or words. At all times, the changing factual circumstances and the precise question pending can be displayed to the class so students can focus their intellectual energy on the correct legal analysis of hypothetical questions. This is the beginning of the academic exploration in class where clarity of the issues is propounded at each juncture; but this clear presentation is not, nor should it become, an end in and of itself devoid of critical legal analysis.

A good rule of thumb is to make sure that every diagram, textual passage, or bullet point displayed to the class serves some legitimate pedagogical purpose that will help make individuals better students and better future lawyers. If it does not, then the information should either be assigned reading to be consumed outside of class, contained in a prepackaged handout of information, or omitted all together. Display technology can render a professor irrelevant in class if all she does is read PowerPoint slides, just as a great textbook or a perfectly summarized handout can render a professor irrelevant in class if all she does is read from the textbook or handout in class.

a. To Use or Not to Use Handouts of the Images Displayed

Display technology not only allows the professor to project images onto a large screen, but also to print those images and distribute them as handouts. But if the projected images constitute spoon-feeding, then do the additional printed handouts add to the student passivity problem? There are advantages and disadvantages to using handouts of the images displayed. If they are used, there are additional considerations regarding whether they should be distributed before or after class.

The rationale for not providing the images or text to students as handouts is that students are required to take notes or draw their own diagrams during class. This requires students to be more active because they must not only consume the information, but also write it out in their own words. This tends to enhance learning and recall. However, if students merely copy each word and, worse yet, do not listen to what is being discussed because they are too busy writing, much is lost academically.

Given this concern, perhaps the display technology images should be handed out before class so that students would not need to waste time copying and, as a result, would have more time to actually listen and think in class. However, they can also be distracted by the handout because they can read ahead to see where class is going. Consequently, they may be less likely to take notes, reasoning that the main points worth writing down are already contained in the handout. This is especially problematic if the professor asks a hypothetical question and sets forth the steps and considerations of the legal analysis on the slides. If the slides are distributed as handouts, the professor could not effectively use display technology to ask hypothetical questions because the answers would be right in front of the students. The professor loses the important pedagogical technique of layering and building the class material. The professor also loses the ability to keep attention focused on the issues at hand because students can be distracted by what they can see is coming next. Finally, at least some passivity is created because the handout gives information that the students may want to read later.

If handouts are not provided until after class, then the possible distraction during class ceases. At first blush, this seems to solve the dilemma, but it also creates its own problems. Students may take sparse notes because they know the handouts are coming. Students may become frustrated and decide that if they are going to receive the handouts anyway, it would be better to receive them before class rather than afterward to relieve the need to guess what to write down. Conversely, they may try to take copious notes during class so that their notes are not incomplete or confused when they try to couple them with the handouts distributed after class. Finally, this technique can only work for one year because the following year the students will likely have copies before class of what is supposed to be handed out after class.

b. Requiring Students to Take Their Own Notes

This handout conundrum underscores the importance of not allowing the medium to become the message. Here, a simple self-regulating test exists. If students can read all of the professor's display technology images for class, and get from them all of what a student who actually *attends* the class does, then the professor is doing nothing more than electronic spoon-feeding. But if a student who comes to class engages academically beyond what is contained in the images and handouts, then a more valuable pedagogical interest is being served.

In my classes, I have chosen only to present my displays visually and let students take notes on the entire class experience. If students take too many notes, they are making a mistake, just as if they tried to take verbatim notes on everything a professor said in a class where there was no display technology used. If students take too few notes, their lack of diligence will hurt them, as it would in any other class. The way I have

addressed this problem is to advise students not to copy every word or diagram used, but instead to use their judgment as law students to determine what they need to write down and what they need to think about during class. I often emphasize (with a different font or color) key words that I think students should write down, but I still leave it up to them to decide what to write, omit, or summarize given their particular views and understandings of the material.

Most importantly, students should take notes that make sense to them so that they can use the notes in the future. They should write ideas and concepts that occur to *them* and not simply copy what their professors say, write, or draw. They need to take notes on what their professors and fellow classmates say about the text, images, and hypotheticals used in class. Display technology can help a professor to organize an analysis, but the professor must engage with students and inspire them to conduct their own legal analysis of changing legal and factual circumstances.

C. The Criticisms and Concerns Should Be Focused On Pedagogy

The critiques of display technology should be understood for what they really are: valid pedagogical observations of professors in general that apply regardless of whether they use display technology. While there are some precautions and best practices that should be observed when using display technology in class, that is a far cry from rejecting display technology altogether. A professor would be putting his head in the sand by refusing to acknowledge the teaching benefits and advantages of available display technology, when used appropriately.

V. CONCLUSION: DISPLAY TECHNOLOGY—A TOOL FOR THE CLASSROOM, BUT NO TEACHING SUBSTITUTE

> *Technology is never a panacea. It won't make our laws more just, nor will it make lawyers more ethical or collegial. But it is a valuable tool: a tool for making ourselves more efficient and more competent; a tool for making the legal system more accessible; and a tool for making the legal profession easier on the legal professional.*[151]

Teaching truly is a noble profession. Law professors, and indeed all teachers of any kind, should feel honored to have the awesome responsibility of helping students understand an academic subject. There are many diverse communication methodologies, styles, and tools to help professors achieve their pedagogical objectives in the classroom. They are all helpful and valuable to students in their own ways. In this Article,

151. Justice Sandra Day O'Connor, *The Role of Technology in the Legal Profession*, LAW PRAC. MGMT., Mar. 1994, at 24, 26.

I have attempted to demonstrate that display technology is a wonderful new tool that should begin to take its rightful place alongside myriad traditional law school teaching methods that have served professors and students so well for many generations.

Promoting deeper understanding, providing tangible reinforcement, and enhancing better retention by using display technology in class to communicate and interact with students through two senses—sight and sound—gives professors an important pedagogical option to help better achieve their educational mission in class. This visual focus on the material in class, not just listening to the professor's words, comports with my general teaching philosophy that the professor should be more of a "guide on the side" to learning rather than a "sage on the stage."[152] This means that rigor, difficulty, and perhaps even verbal ambiguity and obfuscation by the professor should all play a role in challenging law students in class. Thus, if the professor's purpose is to ask a challenging legal question, and perhaps make it more challenging to understand by using sound alone, then visual clarity would frustrate the professor's purpose. Neither display technology nor the chalkboard should be used for that particular purpose.

However, assuming the professor does not just leave the students hanging in class by never clearly explaining or answering, or by having a student explain or answer, then display technology can help greatly in explaining the answer that the professor is seeking. Display technology helps by setting forth in a clear and digestible manner the proper arguments or elements one could or should consider in analyzing a problem.[153] When the purpose is to elicit a sophisticated legal analysis to a complex but clearly stated question, display technology can help in asking the question and in demonstrating how it could be answered by drawing out the analysis from students and then visually reinforcing it.

152. I borrow this phrase from Alison King, *From Sage on the Stage to Guide on the Side*, 41 C. TEACHING 30, 30–31(1993), to make the point that the legal subject matter should be the "star of the show" in class, not the professor as some sort of brilliant oracle dispensing pearls of wisdom from above through Socratic showmanship. By saying this, I certainly do not mean to suggest that any professor currently not using display technology necessarily fits this description or that a professor must use display technology in order to focus on the material to be effective. Still, my belief is that, display technology or no display technology, the focus of class should be more on the course material and not on the professor's persona.

153. Sometimes a professor may choose not to answer a pending question immediately and instead allow it to percolate so that students can grapple with it on their own over the course of perhaps a few classes. This technique can be effective, but at some point before the final exam, the "mystery" should be solved, and display technology is an effective way to convey the eventual solution. In fact, display technology can be an effective way to ask and re-ask the original question as well. Although students need to see exactly how an analysis is done, they eventually must learn how to do it on their own. If not, we stunt their intellectual growth as future lawyers because they never develop the tools they will need to be attorneys on their own. But it is a process, and the first step in the process is to promote clear understanding so that students eventually replicate the clarity of analysis that their professors are (or should be) teaching and demonstrating in class.

I do not suggest that every law professor who does not now use display technology is shortchanging her students. Teaching future attorneys is too important to reduce the practice to a rigid litmus test of methodological "dos" and "don'ts." It would take unabashed arrogance for a professor to assume that only *her* way is the best or right way to teach in law school, and that any colleagues who might disagree must be wrong. In fact, that kind of close-mindedness is one of the traits of which law professors often must disabuse certain first-year law students. Because teaching is so important, professors should constantly search for, learn about, and acknowledge the benefits of new classroom teaching options that can help law students become good attorneys.

Using display technology, and creating the extensive text and conceptual diagrams that go with it, has helped me become more organized in teaching the course material. Presenting information in this tangible way has forced me to take more responsibility for precisely what I am teaching and what I expect the students to accomplish during each class. These positive results were the byproduct of putting together the text and images to be used in class. In approaching cases, problems, and hypotheticals, the visual medium has required me to fully articulate the computerized images—in the form of written text as well as conceptual diagrams and pictures—that help me to promote understanding, facilitate efficient information transmittal, provoke discussion, and foster development of analytical skills. This process has heightened my level of preparation by necessitating tangible, textual productions to serve as a launch pad for the students' aural and visual knowledge intake and analytical development, which goes beyond my preparation for leading verbal-only class discussion.

If I have failed to demonstrate in this Article how valuable display technology is as a teaching option, then I would encourage any skeptical colleague in legal academia to consider the possibilities in his or her own teaching and give it a try. Using display technology in class may not be for everyone. However, it just might be that once it is tried, seeing will be believing. In the end, if one can endorse the chalkboard as a legitimate and helpful classroom teaching tool, then it should not be such a large pedagogical leap to likewise endorse display technology, which in many ways is just a more modern and powerful chalkboard. As such, because a chalkboard has always been seen as helpful—and certainly not as harmful, anti-intellectual, or controversial—so, too, should display technology. Video will not kill the radio star, but it can enhance the overall message by opening up an additional avenue of powerful and effective communication.