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The Use of Video-Conferencing Technology in Legal Education: A Practical Guide

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By Catherine Arcabascio[1]

I.   Introduction

1.   This article explores the use of advanced computer technologies to offer distance learning programs in United States law schools. It begins with an explanation of the original distance learning methods and differentiates them from current methods that incorporate computer-based technologies. The article also explains the different types of technologies available for use in distance learning and describes the model currently in use at the Shepard Broad Law Center at Nova Southeastern University ("Law Center"). Finally, it discusses the pedagogical and planning issues that arise when using this technology, the hardware that is required, and the costs associated with this type of system.[2] This article also seeks to provide the reader with a basic understanding of this technology and to provide enough information for productive experimentation.

II. Distance Education

A. Definitions and Terminology

2.   The terms "distance learning" and "distance education" have been used interchangeably to describe a variety of non-traditional methods of educational instruction, where the teacher and student are not physically and simultaneously present in the same classroom. This includes media such as print, one-way and two-way audio and video, and computer based technologies, such as e-mail, text-based "chat rooms," and listservs. All of these methods are in use today either alone or in combination.

3.   The National Center for Education Statistics' October 1997 Report offers a more high-tech, yet narrow definition of distance education as "education or training courses delivered to remote, off-campus locations via audio, video, or computer technologies."[3] This definition is certainly not one that could have been contemplated in the nineteenth century by distance learning pioneers, but rather is one that looks to the future of distance education programs.

4.   In truth, the definition of distance education is

> as porous as the boundaries separating the physical and virtual locations that can be reached; the learning formats that can be employed; and the instructional methodologies that can be used . . . . The location of the learner, the specific delivery methods, the timing of delivery, the timing of the learning itself, and the presence or absence of a real, broadcast, or electronically interactive instructor . . . are just a few of the elements that can shape the meaning of these terms in professional discourse.[4]

5.   In the following sections describing the origins of distance education, a broader definition of the term necessarily must be used. However, later in this article the term "distance education" will be used only to describe a law school distance education program that relies primarily on video-conferencing technology and at times, audio conferencing technology.

B. Origins

6.   The roots of modern-day distance education can be traced to the mid-1800's.[5] One of the earliest uses of the term distance education has been found in the 1892 catalogue of the University of Wisconsin.[6] However, the concept of distance education may have made an even earlier appearance when an advertisement appeared in the March 20, 1728, Boston *Gazette* offering shorthand lessons by mail.[7] There is no indication of how this course was conducted, but in 1840 another shorthand correspondence course was offered through a newspaper advertisement. Isaac Pitman, who is generally recognized as the first modern distance educator, began teaching shorthand by correspondence in England, where students would copy Bible passages in shorthand and return them to Pitman for grading.[8]

7.   In the United States, "formal" distance education was started in 1873 by the "mother of American correspondence study," Anna Eliot Ticknor.[9] She later created the Society to Encourage Study at Home.[10] One year later, Illinois Wesleyan University allowed undergraduate and graduate students to

pursue degrees through distance education programs.[11] During that time, teachers would use the postal system to deliver course work.[12] This method, commonly referred to as "correspondence study," is still used today. Textbooks, syllabi, and course materials are mailed to a student. The student then completes the work and returns it by mail for grading whereupon the instructor evaluates the work and returns it to the student, again by mail.[13]

8.   The next generation of distance education appeared in the 1930's with the introduction of radio broadcasting.[14] Additionally, in the 1940's, video communication grew with the availability of broadcast television.[15] These are the ancestors of today's technology and continue to be used. A student may either listen to a local radio broadcast or watch a live or videotaped television broadcast of a given class. One need only tune in to cable television during a weekday to discover a variety of classes including language, mathematics, and science. The students enrolled in such classes are required to complete assignments in conjunction with watching or listening to the broadcasts.

C. Current Distance Education: The Advent of Advanced Technologies

9.   The most significant change in distance education came in 1980 with the introduction of two-way video technology, commonly known as video-conferencing.[16] This type of synchronous technology allowed for students located across the country or across the world to join together simultaneously for class while being able to hear and see each other in real-time.[17] Although the first video-conferenced classes had some audio-video delays, they remained two-way communications. In the past eighteen years, the quality of the equipment and the delivery of information has improved tremendously and its potential for widespread use in educational settings grows each day with an ever changing technological landscape.

10. Indeed, distance education has quietly become a pervasive force in education. A 1995 survey by the United States Department of Education found that more than 750,000 students were formally enrolled in distance education courses at various colleges in the United States.[18] One-third of higher education institutions offered distance courses in the fall of 1995. Of the institutions offering distance learning programs, 81% offered programs for undergraduates and 34% for graduate students.[19]

11. The United States has not been alone in its endeavor to offer distance education programs. In fact, the first distance learning research center, called the Deutsches Institut fur Fernstudien an der Universitat in Tubingen, Germany, opened in the mid-1960's.[20] Countries such as Canada, South Africa, Japan, India, China, Spain, and the UK also have significant distance education programs in place.[21] Today, more than ten million students are engaged each year in some sort of distance education program all over the world.[22]

12. Nonetheless, it has not been a smooth ride for supporters of distance education. The problems encountered are due in large part to the original correspondence course format that still is used by some educators. A debate about the value and integrity of distance education in its asynchronous form has raged for over thirty years among education specialists. While that debate is not the main focus of this article, the advent of video-conferencing compels a rethinking of the theories underlying distance education.

13. The rationale for early distance education included increased accessibility, opportunity, and convenience for completing course work.[23] It served as a way to access students in rural areas who would otherwise be unable to attend classes in urban areas.[24] It also offered flexibility to persons who were employed full-time and unable to meet traditional class schedules.

14. Increased access, opportunity, and convenience notwithstanding, educators were, and still are, critical of distance education methodologies because of certain fundamental differences between classic education theory and non-traditional education theory. There are two important elements that exist in classic education theory: temporal and spatial unity.[25] Italian educator and founder of the Centre for Research in Distance Education at the University of Rome, Benedetto Vertecchi explains that temporal and spatial unity cannot exist in distance education courses such as those taught by correspondence or one-way video and television. Indeed, these are the differences that are the subject of most contention between traditional and non-traditional educators.[26]

15. As can be expected, supporters of distance education not only discount the necessity of time and space, but also rely upon several theories that revolve around related notions of the autonomy and self-direction of the learner.[27] In addition, supporters such as Bertecchi view distance education programs as a legitimate response to the "evolution of educational needs."[28] Opponents of distance education contend that face-to-face interaction between students and between students and teachers is an integral part of the education theory and without it, no true learning can occur.[29] Herein lies the heart of the debate between traditionalists and non-traditionalists.

16. However, the introduction of two-way compressed real time video technology may be the beginning of the end of the debate, at least on this front.[30] Although student and instructor are not in the same room during a video-conferenced class, they are communicating face-to-face by using a television monitor. Video-conferencing has made spatial unity an unnecessary element of a face-to-face classroom discussion. At the very least, it has forced us to reconsider traditional concepts of "space." Interestingly, one distance educator actually has lamented that compressed real-time type technologies will merely hasten a return to the style and constraints of conventional teaching methods, something distance educators have long maintained are unnecessary to a valuable educational experience and the adult learning model.[31]

17. Still, there exists a certain skepticism and criticism regarding the use of video-conferencing as a legitimate mode of imparting information. While the barriers are slowly disintegrating at the primary, secondary and post-secondary levels, graduate and post-graduate levels have trailed behind.[32] United States law schools only now are beginning to experiment and show any interest in using this technology. [33]

18. In the fall of 1997, the American Bar Association ("ABA") began gathering data on the use of distance learning technology in law schools and in April 1998 reported its findings in a Distance Learning Survey. [34] Seventy-seven law schools or 43% responded to the ABA questionnaire on distance education. Unfortunately, the survey merely concludes that only a few schools are currently offering courses using

distance learning.[35] While the survey includes both classes that are taught using distance education methods and those that just have a distance education component, the results do not distinguish between the two. Moreover, the survey apparently uses a broad definition of distance learning, which seems to encompass media other than video. Overall, the results of this initial survey shed little light on the use of video-conferencing in law schools. However, there are several law schools, including Nova Southeastern University's Law Center, that have used video-conferencing during the past several years.[36]

D. The American Bar Association Guidelines

19. While the results of the first distance learning survey may not provide much insight into the current use of video-conferencing, the ABA nonetheless does have guidelines in place that govern the use of technology for distance learning in law schools. The ABA is doing its best to keep up with changing technology landscapes and to formulate guidelines that will encourage instructors to experiment with technology, while at the same time ensuring that educational goals are not compromised.

20. In April 1997, the Accreditation Committee of the ABA approved Temporary Distance Education Guidelines for schools wishing to "experiment" with new methods of distance education.[37] The Guidelines first set forth Principles for Distance Education that serve as a backdrop for those wishing to experiment with technology. They remind instructors that educating a law student involves more than the "mere delivery of information."[38] A legal education, according to the ABA, also includes interaction with the faculty in the classroom as well as outside the classroom and interaction with other students.[39] These principles aside, the ABA acknowledges that "[a]s new methods of education develop, legal educators must be aware and ready to implement them in order to provide the best possible legal education to the greatest viable student body."[40] Further, "legal educators [sic] must consider which of these new methodologies provide appropriate legal education tools."[41]

21. There are six ABA guidelines. The first, entitled "Site of Reception," states that if one law school disseminates an educational program to another law school, the program generally will be in compliance with the Principles for Distance Education.[42] As long as a law school that is "receiving" a video-conferenced class has a law faculty, student body, and library or resource center of significant size, it may receive an educational program from a non-law school site, even though the non-law school site may not have a faculty member present.[43]

22. If a law school is not in compliance with these requirements, the Consultant's Office may, on an ad hoc basis, grant an exception if the school can demonstrate specific educational benefits that the course will provide.[44] However, a law student may take only one of these courses.[45] Delivery of course work to a student's home or office, or to a site that only has technical personnel, generally will not constitute compliance. Because of the "special developmental and interactive nature" of first year classes, Guideline 1 also indicates that the use of distance education in those classes will usually not be approved. [46]

23. Externships and clinical programs are governed by Guideline 2, which states:

> [t]he use of distance education may be particularly useful as a means of enhancing externships

or clinical programs. Such externships and clinical programs may, for example, have classroom components which are difficult to deliver on campus at the law school site. The use of distance education technology in such cases may be designed to enhance a law student's education and provide greater efficiency.[47]

Yet, the ABA also is quick to point out that all distance education classes must conform to Standard 304(g) which prohibits granting credit for correspondence courses.[48]

24. The ABA may be concerned that a law school could become a "Virtual Law School."[49] The Accreditation Committee authorized the Consultant's Office to give permission to law schools to conduct experiments using distance education methodologies "while keeping in mind the direction of Standard 304(g) that approved law schools may not grant credit for courses taken by correspondence study."[50] It can be argued that the ABA use of the term "distance education" is all encompassing and therefore includes technologies other than video-conferencing. However, the focus of the Guidelines appears to be the video-conferencing technologies.[51] That said, the ABA Guidelines are troubling in their subtle comparison of this cutting edge technology to a "correspondence" course method of teaching and learning. They evidence a lack of understanding of the technology as it exists today and of the underpinnings of the distance education models, which encourage individual and independent learning and consider it a viable learning model. In sum, while it appears that the ABA is being cautious, it apparently also is acknowledging what many in the private sector have known for some – time that the use of computer technology is inevitable, and is the driving force in achieving the globalization of many markets.[52]

III. The Nuts and Bolts of Video-Conferencing

25. In the world of technology, it is sometimes difficult to keep up with the changes that seem to occur overnight. Video-conferencing is part of that ever-changing world, and a worthwhile addition to the personal computing arena. These changes include improvements in audio and video quality, delivery speed, size, and most importantly, cost. As with most technologies, however, the ultimate trade-off will occur between cost and quality.

A. The Main Classroom

26. While most instructors either are not included or do not care to be included extensively in the classroom design process, it is the instructor that suffers the pains of a poorly designed classroom. This is especially true in a video-conferencing room. It is extremely important for an institution contemplating the notion of starting video-conferenced classes to receive input not only from other academic institutions and businesses using the technology, but also from the people who use the technology regularly.[53] As this is a controlled audio and visual medium, every effort must be made to ensure audio and picture quality. Thus, details such as table shape and lighting become even more important.

27. Any room can be used for a distance learning program, although some rooms do work better than others. The initial issues that an institution must decide are whether there will be a dedicated video-conferencing room, whether the room will serve double-duty both as a video-conferencing room and a classroom, and

whether the equipment will be used in a variety of properly wired rooms.[54] If a room is to be used solely for video-conferencing or is to serve as a multi-purpose room, the equipment may be housed permanently in a wall unit at the front of the room. If not, most systems fit on a large portable cart that can be wheeled to the front of the room when ready for use.

28. The choice of furniture for the room is also linked to the proposed use of the room. If the room is going to be used for other purposes, the furniture should be easy to move. The best choice for all video-conferences is a table set up in a V-shape. The configuration of the conference room tables is an important element of a successful video-conference. Using a V-shape configuration with the video equipment at the open end of the table or an oblong configuration with the equipment at one end of the conference table allows for the distant sites to see all of the participants and feel as though they are actually a part of the classroom. This configuration also helps with the distant site's depth perception.

29. Another important element in a well-planned video-conference room is lighting. The depth of field is directly related to the availability of light to the lens.[55] Rooms that have too much natural light streaming through windows makes it harder for the distant sites to see the images being sent to them. Further, improperly placed fluorescent lighting can drain color in the room and can also cause glare on the monitors. Ideally, lighting in this room also should not come from above because of the shadows it creates.[56] Rather, the light should emanate from an angle and should come from several broad sources. [57]

30. Some dedicated video-conference rooms are set up like true broadcast studios. They have dark colored curtains surrounding the room and professional lighting hanging throughout. The resulting images are more crisp and clear. However, in most cases, this type of room is unavailable or too expensive, in light of all of the other costs associated with purchasing the video-conferencing equipment. Thus, the room should either be one without windows or one with curtained windows. Additionally, special attention should be given to the color of the walls. An improper color will also affect the crispness of the picture.

B. The ISDN Connection

31. In order for information to move from one site to another when using video-conferencing, it must travel either over terrestrial lines or via satellite.[58] Many video-conferencing systems generally run by using Integrated Services Digital Network lines, more commonly known as "ISDN" lines. Basically, ISDN is no more than a network, run by local telephone companies, that uses a consolidated, specific set of standards for carrying digital, as opposed to analog, data, audio, and video information over specially configured standard copper telephone lines.[59] ISDN lines transfer information by "circuit-switching" rather than "packet-switching."[60] When digital information, such as audio and video, is circuit-switched, the channel used to transfer the information is only used by the sender and receiver of the information.[61] It functions just as a telephone call does.[62] In contrast, the channel used when information is packet-switched is shared by many users.[63] If a channel is transferring a large number of "packets" of information originating from many users, congestion on the line becomes inevitable.[64] Thus, depending on the amount of users at any given time, it would be difficult to predict any consistency in the successful transfer of information. In light of this inconsistency, technologies that rely on packet-switching may not be the best choice for academic institutions.[65]

32. When discussing the delivery of information through the use of terrestrial lines and services such as ISDN, the most important concept is bandwidth. The term "bandwidth" is most often used when discussing how much information can pass through a given delivery mode, like a telephone line, at one time. The bandwidth is measured in kilobits per second. The greater the bandwidth, the more digitized video and audio information can pass through simultaneously. The more information that can pass through simultaneously, the less jerky the picture will be and the more synchronized the picture will be with the accompanying audio. Thus, one ISDN line, which has a bandwidth of 128 kilobits per second, has less bandwidth than a double ISDN line, but more than a "twisted pair" of standard telephone copper wires.[66]

33. A double ISDN line has less bandwidth than what is known as a T-1 line, which has a bandwidth of approximately 1.544 megabits per second. These types of lines can carry more information than regular phone lines, but less than fiber optic lines. Fiber optics may one day be able to replace ISDN lines as the primary carrier of information in distance learning classes. At this writing, however, fiber optic lines remain an expensive alternative for the average university.[67]

34. The importance of bandwidth and the problems that can occur with packet-switching can be explained by using the following analogy. Four cars can travel down a four-lane highway side by side at sixty-five miles per hour and will arrive at the end of the highway at the same time. If those cars arrive at the end of the four-lane highway only to find a one-lane dirt road, a "bottleneck" will occur because not all of them may pass at the same time. Each will have to take its turn to travel down the road and each will reach the end of the road one at a time. The same thing happens with digitized information that travels through terrestrial lines. If there is insufficient bandwidth or if there are too many packets of information, the digitized information cannot pass through simultaneously. The result is a blurred, delayed-movement video combined with audio delays.

35. ISDN service on already existing telephone lines must be ordered through the local telephone companies. "Installation" of ISDN service costs approximately $150.00 and takes approximately four weeks. Of course, the price and time vary according to location. Some telephone companies require six weeks to provide ISDN service. Although many urban areas have ISDN capabilities, there are still some locations that do not.[68] In addition, the cost for ISDN service will increase significantly if the ISDN customer's premises is too great a distance from the telephone company's central switching station. If the distance between the central switching station and the ISDN premises is greater than 18,000 feet, the ISDN signal cannot be transmitted and a device called a "repeater" is required to regenerate and retransmit the signal. The cost associated with this can rise above $6,000.00. In addition, the monthly long distance charges for a weekly two-hour class will vary from location to location, but will also add to the cost.

36. As with all technology, ISDN may soon become a thing of the past. A new technology, called Digital Subscriber Line (DSL) is already being utilized by telephone companies around the country and is expected to replace ISDN within a few years.[69] DSL will be able to provide high bandwidth to homes and small businesses over ordinary copper telephone wires – at least 512 kilobits per second of information, in contrast with ISDN's 128 kilobits per second capabilities.[70]

C. The Computer System

37. In the last decade, video-conferencing systems have moved away from large, independent systems which required quite a bit of bandwidth, not to mention money, to those that can operate through the use of desktop personal computers and telephone lines. The result has been a drastic reduction in price and more widespread availability.

38. There are several components that allow a video-conferencing system to operate. The most important is a device called a CODEC, an acronym for coder-decoder. Even with the bandwidth available over an ISDN line, a signal still must be compressed using a CODEC. A CODEC digitizes and compresses the outgoing signal and decompresses the incoming video signal.[71] A CODEC is assembled onto a computer board using computer processing chips.[72] It is contained inside a personal computer that acts as a host for the video-conferencing system and conferencing software. All the while, it maintains all of its other functions as a personal computer. It should be noted that while compression is a necessity, an inverse relationship exists between compression and picture quality. The greater the compression rate, the poorer the picture quality will be.

39. A system also may contain a "bridge." A bridge is a device that allows for more than two locations to connect for "multipoint" conferencing. Simply stated, the bridge allows for students at different locations to connect to the main site for a lecture simply by dialing into the bridge location. It is the video equivalent of a conference call. Depending on the type of bridge, as many as thirty-six sites can be connected at one time.

D. The Video and Audio Systems

40. A basic video-conferencing system contains one or more cameras, two television monitors, microphones, and a main system control board. While any system can utilize more than one camera, the system can function with just one. The camera can be placed anywhere, but usually is at the front of the room and atop a television monitor. It can pan, zoom, and tilt in almost any direction. In addition, wireless touch pads, also commonly called "look-at-me buttons," can be used by participants to control the camera in a video-conference. These touch pads are programmed prior to the conference. A student who wishes to speak can press the button and the camera automatically will turn to the location of the button. Ideally, at least one button for every two persons should be available at the conference table. Voice-activated cameras, commonly known as "follow me" cameras, also are on the market, although they are more expensive.

41. The monitor or television can be of any size. Even though in theory a single monitor can be used, many systems utilize two television monitors that are placed side by side. One monitor displays the video image of the student at a distant site while the other displays the persons at the main conference site. Thus, the instructor will be able to see the image that is being transmitted to the distant locations, and can modify it if necessary. For example, if the instructor observes that a student cannot be seen because the camera is too far from the student, the instructor can take notice and make the appropriate adjustments.

42. In addition, a system may contain other equipment such as an electronic whiteboard. It is used like a blackboard, except that the information written on the board is transferred electronically to the different sites. Even if the whiteboard is erased, the information nonetheless is saved and can be called up at any time on the computer screen for later use. A system also may use an electronic document stand, which is

the hi-tech equivalent of an overhead projector. Any sheet of paper may be placed on the stand and its image will be transferred electronically to all of the students.

43. The audio system may contain one or more microphones, which should be situated in places where they can clearly transmit the voices of each of the participants in the room. This can usually be achieved by placing microphones in the center of the room. A video-conferencing microphone is one of the most important components in the system. A good microphone should be able to adjust the voices of all of the speakers so that the audio level transmitted will be the same for every speaker, no matter how loud or quiet they may be.

44. There is a slight delay in the audio transmission, about one-third of a second, which can cause an echo. [73] An echo canceller is used to eliminate this echo.[74] However, a slight delay in audio still will occur if a system is operating on a narrow bandwidth.[75] There is virtually no delay when using a double ISDN line. However, a slight delay exists when using a single ISDN line. It also should be noted that in a bridged video-conference, even if some locations are operating on broader bandwidths than others, the communication among all of the participants will occur at the lowest common bandwidth.

45. All of the audio and video functions are controlled by the instructor through the use of the wireless main control panel. This board can control incoming and outgoing volume, all camera functions at the main site and distant sites, and all added components such as the VCR, whiteboard, and document stand. If the camera at the main site is not voice activated, it may be controlled manually either by the instructor or the students.[76]

46. As with all computer systems, the cost varies depending on the system's capabilities. A full system can cost as little as $20,000.00 or in excess of $60,000.00.[77] Of course, there are the added costs associated with the installation of ISDN lines and long distance charges.

E. The Off-Site System

47. A student at an individual distant site will require either a personal computer or other equipment with video-conferencing capabilities. The personal computer will contain the same conferencing software, CODEC, and computer equipment as the main system. However, it will have a small camera that sits above the computer monitor, and it also will have an external microphone. On the monitor, the student will be able to see any person who is speaking.

48. A recent addition to video-conferencing is a system introduced by RSI Systems, Inc. called the Eris 1000. An Eris system, contained in a small box, is not a personal computer, but does contain a CODEC and computer-free software for a video-conferencing system. Rather than using a computer monitor, the Eris 1000 uses a television monitor. Moreover, it can utilize the handset of a telephone instead of a keypad. Like the personal computer, it has a small camera which sits atop the monitor. The Eris 1000 is compatible with the PictureTel computer system. The personal computer system costs approximately $1,600.00, while the Eris system, exclusive of the cost of the television monitor, runs approximately $1,100.00. Both of these estimates exclude the ISDN and long distance charges.

49. Of course, there always is the option of having a student report to an existing video-conferencing site. A university that has been involved with distance education for some time may already be using video-

conferencing in its other schools. If it is, it may already have sites in other parts of the state or country that may be used instead of purchasing individual desktop systems. If the university itself does not have a site, other universities near the distant site may have conferencing capabilities and may be willing to rent their system for an hourly fee. In a clinical program, a placement may itself utilize video-conferencing. In addition, companies, such as Kinko's, also offer video-conferencing, although their hourly fees tend to be quite high.

F. One School's Implementation: The Clinical Programs at the Shepard Broad Law Center at Nova Southeastern University

50. In 1996, the Law Center decided to begin using the main campus video-conferencing equipment in order to expand its clinical externship programs. Other schools at NSU had been using video-conferencing technology in distant education programs since the 1980's. Even though the technology used at NSU's other schools was highly sophisticated and literally steps away, the law school had never before ventured into this area. In January 1997, the law school held its first video-conferenced class as part of the Criminal Justice Clinic.

51. The Law Center's clinical programs require that the students meet on campus for the first three weeks of the semester. During that time, the students work on a compressed schedule to earn six credits in three distinct classes: a doctrinal class, a skills class, and an interdisciplinary class.[78] Upon successful completion, the students depart to their respective placements. During the ensuing twelve-week placement, the students meet bi-weekly with their instructor and classmates during a video-conferenced class.

52. Approximately six to eight weeks prior to a student's arrival at a placement, the Law Center contacts local telephone companies to determine whether ISDN service is available. If it is, the Law Center orders the telephone lines and contacts the placement to request that a separate telephone line be installed.

53. Currently, the law school's main conference room uses a portable Picture-Tel system, in an existing mock courtroom, that has been fitted with movable conference tables. The courtroom was a good choice in some respects for some of the clinical programs and for administrators because of the many skills components that are taught in the first three-week period. In some clinics, all of the classes are held in the same room.[79]

54. Since clinic students are scattered not only around the country, but around the world, the Law Center uses a multi-point bridge system. Some students are sent desktop systems while others use already existing NSU sites or privately maintained sites. The computers are shipped to the placement, and the student assembles them upon arrival.[80]

55. Approximately two hours prior to class, the tables are arranged in an open oblong configuration and the computer system and monitors are wheeled to the front of the class. A technician begins to establish communication with all distant sites and conducts the testing of the system approximately two hours before the class. If a problem should arise with one of the sites, the technician always has an audio-conference system available as a back-up. The audio system's microphone can be placed beside the video system's microphone, which rests on its own table in the center of the room. Next the technician programs the control board and the touch pads and places them around the table. The system is now

ready for use.

56. When the class is ready to begin, the instructor sits directly in front of the televisions at the far end of the conference table. Students are seated on the long sides of the tables and can face each other or the camera atop the monitor. The conference tables seat approximately twenty persons.

57. The clinic is just the first of a series of projects at the law school. Currently, several other projects are being considered, including team-teaching courses with other law schools and having professors at other law schools "visit" electronically.

IV. Teaching with Video-Conferencing: Practice, Practice, Practice

58. Among distance educators, it is well known that the major difference between successful and unsuccessful distance instruction is the amount of advance planning that is required.[81] Usually, preparing for a video-conferenced course takes more time than for a "traditional course."[82] As noted by Professor Nick Eastmond, "[t]he practice of 'just in time delivery' – deciding the hour prior to class to show a film or engage in a group activity – will likely not work out if attempted under the conditions of distance education."[83] Because an instructor is not at the same location as the students, materials must either be distributed to the students before they depart or with enough time for the students to review prior to class.[84]

59. In some clinic classes, this may not pose a problem because the subject of classroom discussion is drawn from the student's own experiences at the externship placement. Because a clinic provides such a rich source of new subjects and issues, a flexible approach to teaching a clinic class works well. This does not have to be sacrificed in a video-conferenced class. If a particularly interesting issue arises at a placement that warrants an open discussion but requires additional readings, the students can be informed of the subject matter with as much notice as possible. In this situation the instructor may communicate with the students via phone, fax, e-mail, or mail on an as needed basis. In addition, the students can retrieve relevant cases, statutes, and rules of law from the clinic's website.

60. However, teaching with technology may at times pose some difficulties. Sometimes, teaching a video-conferenced class can be very similar to teaching a traditional law school course. Other times, however, teaching it can be likened to juggling with an unknown quantity of ever-changing objects. There are many different scenarios in which one can teach using compressed video and each one has a different dynamic and each poses its own peculiar challenges:[85]

  (1) A number of students each at an individual remote site and an instructor at yet another remote site.
  (2) An instructor at an individual site and a group of students at a remote site.
  (3) An instructor and some students at one site while there are other students at individual remote sites.[86]
  (4) Two groups of students at separate sites with one instructor at each site or an instructor at only one of the sites.

61. In all the scenarios, assuming that the class is an interactive one, a video-conferencing instructor must be

a good juggler.[87] She must act as facilitator to the classroom discussion, as moderator, and as the enforcer of protocol so that all students can hear and be heard, see and be seen. Interaction is indeed the key to the successful use of a video-conference system. If interaction is not achieved or desired, then the resulting class will be as effective as a video-taped class. The interactive nature of this system is what distinguishes it from its distance education delivery system cousins: correspondence courses and one-way television. And, it is what makes this delivery system so much more effective. The challenge for the instructor, however, is that interaction is much more difficult to achieve when using this type of delivery system because it must occur in a controlled environment.

> "The responsibility for effective interaction falls squarely on the shoulders of the instructor." *Interaction doesn't just happen*; it must be a clearly articulated component of [the class'] overall design. The instructor must employ purposeful strategies to initiate interaction. Failure to do so will inevitably result in an awkward, uncomfortable silence when distant students are asked to [speak].[88]

62. Keep in mind that any teaching style that is ineffective in a face to face class will be even less effective in a video-conferenced class because any problems or weaknesses in teaching style are exacerbated by this delivery system. However, in many ways, law professors are in the best position to utilize this system effectively because they are more apt to interact meaningfully with the students by relying upon the Socratic method or the problem method. Law students also should be accustomed to these methods and to being actively engaged in class. This type of controlled dialogue translates well into a video-conferenced class.

63. Nonetheless, achieving interaction when using some systems still poses unique challenges. If a camera is voice-activated, the instructor must make sure that the students are utilizing the technology properly by actively using the camera's "look at me" directional control buttons. If a student forgets to push the button and force the camera lens toward her, the instructor then must control the camera to ensure that the far-end students can see the student who is speaking. Moreover, the instructor must ensure that the students are speaking in a manner that will enable the distant students to hear them. In addition, the instructor must make sure that the students do not speak out of turn or step on each other's words, making it impossible for the far end students to follow a conversation.

64. In most systems, an audio delay exists because the information being delivered over the ISDN lines must be compressed, travel to the delivery site, and then decompressed.[89] If the system is operating on one ISDN line, the delay will be greater than if it were operating on two. In addition, if the video-conferencing system is voice-activated from site to site, the camera will hear each person speaking and will try to shift the camera's focus to the speaking site. This further adds to the delay. When such delays exist, students and instructor sometimes "cross lines" and their comments become a series of cutoff sentences, usually beginning with "Go Ahead." "No. I'm sorry, you go ahead." This polite, yet annoying, exchange can loop endlessly if not kept in check. Another solution is to require the students to mute the audio until they are ready to participate or are required to answer.

65. Giving students an established protocol to be followed in video-conferenced classes helps maintain the flow of information. For example, the tried and true method of raising a hand before speaking works well when using a system that simultaneously displays all of the distant students, except that they may have to rely on a movement that is a bit more visible on the screen. In exceptionally active exchanges, it is

sometimes difficult to slow down the students to a pace that will be understandable to the distant students, even when hands are being raised. Thus, the instructor must constantly listen to the class dynamic and keep it in check without sacrificing the spirited exchange.

66. If using a system that does not simultaneously display all of the students "on the screen, a visual cue obviously will not work. Accordingly, an audio cue will be necessary. Because the camera is voice activated from site to site and requires several seconds of sustained sound before it switches to speaking students, instructors can suggest a standard interruption sentence that the students can use to participate next in a discussion." Another suggestion is to "learn to finish thoughts in a single statement with an obvious conclusion," so that participants will know that the speaker has finished the sentence. Moreover, "[l]isteners should avoid interrupting and use visual cues . . . (nodding) instead of verbal affirmations. . . ."[90]

67. The instructor also must make sure that the far-end students are included in the near-end conversations and that they participate. Keeping a list of the distant students on the desk while conducting a class is a handy reminder that the distant students are a part of the class. However, because of the nature of the video system and the fact that in some systems the far-end students are not all seen on the screen at the same time, it is important that their comments be actively sought and interwoven into the rest of the class' discussions.

68. After learning to use the basic video-conferencing equipment, the instructor may want to add such components as the electronic whiteboard or the document stand.[91] Of course, attempting to utilize all of these components merely will add more objects to the juggling act and so the novice "juggler" may want to proceed with caution. Learning how to use the equipment is just the first step of the process. Once that is mastered, an instructor must determine how best to utilize the delivery system.

69. With this juggling act occurring, it is sometimes quite difficult to focus on the real task at hand: teaching. The biggest difference in teaching in a traditional classroom and teaching in an electronic classroom is that the instructor does not have the benefit of the visual cues one gets from physically being in the same room with another person. Anyone who has stood before a packed classroom and glanced out at the sea of faces knows that at any given time, one student or another will look perplexed, confused, bored, or even sleepy. By the same token, you may see when "the lightbulb goes on" in someone's mind. These are the things that are not noticed with the same ease. Yet, these are the cues that many instructors rely upon in class.[92]

70. Instead, everything is seen through the lens of a camera. Thus, it is the perspective from the camera's view of the classroom that affects the classroom instruction.[93] For this reason, it is important to discuss some basic concepts used in television production in order to conduct a video-conferenced class more effectively.[94]

71. A camera utilizes any one of three perspectives: a) reportorial; b) objective; and c) subjective.[95] The reportorial view is one where the speaker directly addresses the audience, much like an anchor reports the news. The objective perspective is one where the audience plays eavesdropper.[96] "No one is addressing the camera directly; the camera is just an observer of the action."[97] The subjective view

occurs when the viewer "assumes the television presenter's perspective and observes the environment through the presenter's eyes."[98] The first two seem to be the ones most commonly used in a video-conferenced class.[99]

72. Another television production concept that should be kept in mind by an instructor is the "field of view."[100] This refers to what is seen from the camera's perspective. The three basic shots are: a) long; b) medium; and c) close-up.[101] In classroom terms, the long shot refers to a shot of the entire class or all of the students, who should be seated at a U or V shaped conference table.[102] A medium shot refers to only to part of the classroom. This shot can include three to four persons. A close up refers to just one person, usually the head and shoulders.[103]

73. In a classroom, the reportorial perspective is the most often used by the instructor and necessarily used by the distance students, who are directly in front of the camera. This is the most effective view because it is usually a "close-up" of the speaker. It allows the viewer to see the facial expressions of the speaker and to watch the speaker's lips move as she speaks.[104]

74. The "objective" perspective is not as effective as the reportorial perspective commonly used by the instructor, but unfortunately it is used most of the times by the students because they are facing each other at a U-shaped table. Were the students to speak directly at the camera, they would never be looking directly at one another. This makes for an awkward and artificial classroom experience. In a class such as the clinic class, where students for the most part engage in healthy debate with one another, this problem is unlikely to be eliminated by a mere change in the configuration of the classroom.

75. A law school interested in utilizing this type of technology should provide training to the instructors. An understanding of the hardware and software will enable the instructor faced with having to run the system alone to better troubleshoot and also will offer some ease in using the equipment.[105] Once the instructor has been taught to use the technology, the instructor should spend some time practicing with the equipment before conducting a class.[106]

76. Students, too, must be taught how to best utilize the system. If possible, the students should be made aware of the same things that are taught to instructors. Ideally, the students should be introduced to the system well in advance of the first video class. This can be achieved by connecting to an existing site and allowing the students to simply experiment informally. If that is not possible, the instructor or technical assistant should take some time during the first class to teach the students about the system and allow the students to interact with one another prior to the commencement of class. The instructor or technical assistant should explain how the system operates, what type of hardware is used, how each piece works, and, if the student is at a distant site, how to troubleshoot. Each student should be allowed to inspect all of the equipment. In addition, a test run should be done so that all students can try the "look at me" buttons to see how they operate and also can observe how the voice-activated camera shifts from location to location.

77. The instructor or technical assistant should be candid about any problems that the system may have. For example, if the system operates with a several second delay, the students should be informed of the delay and why it occurs. Then, the students can be taught how to best deal with the delay.

78. Finally, no discussion of teaching with technology would be complete without mentioning the technology mishaps that occur with all computer-based equipment. Crashes occur, lines are disconnected, and communications are lost. Often times, the instructor will be called upon to act as a troubleshooter when the system is not functioning properly. The instructor, as well as the students, must learn to be flexible and to deal swiftly with these problems.[107] Ideally, someone other than the instructor who is familiar with the technology should be close by to make sure that these problems are dealt with swiftly. Having that type of assistance will allow the instructor to maintain the flow of the class. If all else fails, the instructor should be prepared to continue class using audio-teleconferencing.

79. Moreover, the students should be told that, as with all technology, using a video-conferencing system requires all participants to be flexible. Educating and forewarning the students is a much better strategy than waiting until a problem arises in class and takes the students by surprise. Students should be taught to take the occasional glitch in stride and to attribute it to the "cost of doing business" with technology.

V. Conclusion

80. Video-conferencing is an exciting and powerful technology with the potential to change not only how we educate, but to change almost every aspect of our lives. As video-conferencing comes of age, one can imagine a day in the not so distant future when calling someone, even a colleague in the office next door, on a phone that has no video capabilities will be considered ancient history. When utilizing this technology in any field, the basic question remains the same: Can this technology be used to provide better services? In education, the question that must be asked is whether this technology can be used to improve teaching and to provide a better learning experience for students.[108]

81. In an extern clinical program such as the one described in this article, the answer is relatively simple. When a contemporaneous classroom component is a clinical requirement, video-conferencing allows the clinician to permit students to work in locations that might otherwise have been foreclosed because the placements were not in driving distance to the law school classes. When that happens, technology has gone above and beyond a clinician's expectations.

82. However, the entire law school curriculum could benefit from the use of video-conferencing. For example, the ABA itself has acknowledged the important trend toward globalization in legal education. At the American Bar Association's 1995 Annual Meeting, a panel of highly regarded lawyers and academicians held a panel discussion entitled "The Globalization of the American Law School." At that meeting, Dean John Sexton of the New York University Law School, spoke of the "global village" that is emerging in this century.[109] Dean Sexton opined that the "success of the emerging global community will depend in large part upon the integration and accommodation of disparate traditions through law."[110] In order to achieve that globalization, changes must occur in law schools; and American law schools must collaborate with colleagues from around the world.[111]

83. The use of video-conferencing could enhance any law school's attempt to globalize. It holds the key to making that possible on a wide scale, and not just for the few students able to afford the price of an extended stay in a foreign country. The emerging, more affordable technologies offer exciting possibilities for most law students to learn about "disparate tradition through law."

84. For example, this technology would allow a foreign professor, who could not leave her country for an entire semester and who would not have been able to participate in an exchange program, to teach for the whole semester without having to leave home. Similarly, a student who otherwise could not have afforded the cost of traveling to a foreign country would nonetheless have the opportunity of learning from a foreign professor.

85. What educators and the ABA should keep in mind is that the use of technology is not an "all or nothing" proposition. Video-conferencing does not have to be the backbone of any program. "Technology is an enabling mechanism; it is not an end in itself."[112] It can be used effectively to enhance a program that also involves in the flesh face-to-face exchanges between students and professors.

86. However, as with the entire legal community, when it comes to technology, there exists a fear of change in legal academia.[113] Moreover, a perception exists that "distance learning" is fundamentally different from traditional classroom instruction.[114] Some scholars doubt whether this form of education is comparable in quality to traditional classroom education.[115] Even if that were true, the introduction of two-way video-conferencing has significantly changed distance learning. While differences certainly exist between a class in which an instructor and a student are in the same physical space and one in which the student and instructor are communicating face to face but at a distance, the most important element of quality education exists in both – *interaction*.

87. Law schools are not alone in grappling with the growing pains brought on by the use of technology to enhance education. Currently, the Council of Graduate Schools is preparing its third policy statement on the topic of graduate distance education.[116] It hopefully will reflect the changes that have occurred in distance education as a result of technology-based delivery modes.[117] Some graduate school educators believe that the issue of residency requirements should be revisited in order to determine what the term means in relation to distance learning.[118] One suggestion is to drop the concept of "residence" and to focus instead on the intended goals of residency requirements and how those goals can be achieved with the new delivery methods.[119] That might sound radical to those currently involved in legal education. However, the use of technology in education is not merely a fad that will disappear at the end of a season. It is here to stay and educators need to prepare themselves for the decisions that will eventually confront us.

88. At least some educators agree with the view espoused in this article that educators should not automatically discount this technology by claiming that it is too difficult to implement or that it does not provide a quality education.[120] Nor should educators be too quick to embrace a technology without determining whether it can help provide a better educational experience for students.[121] Rather, educators should put their energy to good use by focusing their attention on thinking of ways to best utilize this technology in order to provide a quality education.[122]

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Nova Southeastern University, Shepard Broad Law Center. The author would like to extend a special thanks to Shak Vasilou for his technical expertise and guidance. All technological information that does not contain a footnote is directly attributable to Mr. Vasilou. Thanks also to Professor Pearl Goldman and Tom Rogers, Esq. for their editorial assistance, Rhonda Gold, Esq., John Soughers and Deanna Bufo for their research assistance, and to Jesse Monteagudo for his assistance in preparing this article for publication.

[2]. This article presupposes the existence of appropriate, well-supervised distant placements.

[3]. This narrower definition of distance learning will be relied upon in the remainder of this article. It will include all computer-based technologies such as compressed video, real-time audio, e-mail, web pages, listservs and the Internet.

[4]. Maryhelen Jones, *Future Fast Forward: Libraries and Distance Education*, ONLINE COMPUTER LIBR. CENTER 1, 3 (1998) *at* http://www.oclc.org/oclc/man/10256dis/jones.htm (last visited Jan. 29, 2001) (quoting Maryhelen Jones & Thomas J. Moore, Providing Library Support for Extended Learning Programs: A Partnership Model, *in* LIBRARIES AND OTHER ACADEMIC SUPPORT SERVICES FOR DISTANCE LEARNING 1 (Carolyn Snyder & James Fox eds., 1997).). *See also* JOHN R. VERDUIN, JR. & THOMAS A. CLARK, DISTANCE EDUCATION: FOUNDATIONS OF EFFECTIVE PRACTICE 8 (1991) (suggesting this short definition: "[A]ny formal approach to learning in which a majority of the instruction occurs while the educator and learner are at a distance from one another.").

[5]. *See* F. Barry Brown & Yvonne Brown, *Distance Education Around the World, in* DISTANCE EDUCATION STRATEGIES AND TOOLS 3, 5 (Barry Willis ed., 1994). Less formal methods of "distant" learning probably occurred much earlier when "itinerant wanderers deliver[ed] information by word of mouth . . . to eager recipients encountered during their travels." *Id. See also* VERDUIN & CLARK, *supra* note 4, at 15.

[6]. VERDUIN & CLARK, *supra* note 4, at 8.

[7]. *Id.* at 15.

[8]. *Id.*

[9]. *Id.* at 16.

[10]. *Id.*

[11]. *Id.*

[12]. *Id.*

[13]. *Id.*

[14]. BROWN & BROWN, *supra* note 5, at 5.

[15]. *See* PATRICK S. PORTWAY & CARLA LANE, GUIDE TO TELECONFERENCING AND LEARNING 2 (1994).

[16]. *Id.* AT&T actually debuted an analog video telephone at the 1964 Worlds' Fair, but the required communications lines were cost-prohibitive at one thousand dollars a minute. *Id.*

[17]. "Synchronous" communication is that which takes place in the same time frame. Chat rooms are

synchronous, even though the parties communicate in print, but E-mail and discussion boards, where messages are posted, would be considered asynchronous.

[18]. *Distance Education in Higher Education Institutions*, NAT'L CENTER FOR EDUC. STAT. ch. 3 (Oct. 1997) *available at* http://nces.ed.gov/pubs98/distance/chap3.html#number.

[19]. *Id.*

[20]. OTTO PETERS, OTTO PETERS ON DISTANCE EDUCATION: THE INDUSTRIALIZATION OF TEACHING AND LEARNING 17 (Desmond Keegan ed., 1994).

[21]. Brown & Brown, *supra* note 5, at 7.

[22]. VERDUIN & CLARK, *supra* note 4, at 17.

[23]. Kevin I. Minor et al., *Distance Learning: Examining New Directions and Challenges for Criminal Justice Education*, 16 ACADEMY OF CRIMINAL JUSTICE SCIENCES TODAY 3 (1998).

[24]. *See generally* VERDUIN & CLARK, *supra* note 4, at 103.

[25]. Benedetto Vertecchi, *Structural Analysis of Distant Education, in* THEORETICAL PRINCIPLES OF DISTANCE EDUCATION 152, 155 (Desmond Keegan ed., 1993).

[26]. *Id.* Proponents of the distance education model insist that these unities are not even necessary to provide an effective education. *Id.* at 169.

[27]. *See generally* Cheryl Admundsen, *The Evolution of Theory in Distance Education, in* THEORETICAL PRINCIPLES OF DISTANCE EDUCATION 61, 61-73 (Desmond Keegan ed., 1993).

[28]. Vertecchi, *supra* note 25, at 157.

[29]. *See* Minor et al., *supra* note 23, at 4.

[30]. This technology is far from being available in a majority of distance learning programs, much less to the more than ten million students of all ages engaged in distance learning programs in nearly every country of the world. According to PC Magazines July 1997 issue, approximately 38% of homes in the United States contain a personal computer. Thus, not everyone can have access to programs such as the ones currently in use at the Law Center, unless a computer is provided. At the Law Center, all first year students are required to have laptop computers.

 Nonetheless, there is no doubt that the debate between traditionalists and non-traditionalists on distance education will continue on other fronts, but the elimination of time and space limitations on distance education is the crucial factor in determining the value of distance education.

[31]. Louise Sauve, *What's Behind the Development of a Course on the Concept of Distance Education?, in* THEORETICAL PRINCIPLES OF DISTANCE EDUCATION 93, 106-07 (Desmond Keegan ed., 1993).

[32]. Andrea Johnson, *Distance Learning and Technology in Legal Education: a 21st Century Experiment*, 7 ALB. L.J. SCI. & TECH. 213, 226-27 (1997).

[33]. Currently, no other law school uses video teleconferencing in a clinical program. However, one law

school plans to use the Law Center clinical video-conferencing model beginning in 1999. Only a handful of law schools use teleconferencing in classes in the regular curriculum. Most of these projects include law schools connecting to one another and jointly teaching a particular class. For example, the Law Center and another law school are currently planning a joint class on Tort Law.

[34]. Laura N. Gasaway, *Distance Learning Survey*, 34 ABA SYLLABUS 3, 16 (Summer 1998).

[35]. *Id.*

[36]. The Law Center began its video-conferencing program in January 1997 when the author of this article taught a weekly two-hour clinical class to students in Virginia, New Jersey, Georgia, and various parts of Florida. *See also* Johnson, *supra* note 32; Judy Meadows, *President's Briefing: Distance Education,* AMERICAN ASSOCIATION OF LAW LIBRARIES SPECTRUM, Dec. 1997, at 25.

[37]. ABA Memorandum D9697-59, Temporary Distance Education Guidelines (1997).

[38]. *Id.* at *Principals for Distance Education.*

[39]. *Id.*

[40]. *Id.*

[41]. *Id.*

[42]. *Id.* at *Guideline 1.*

[43]. *Id.*

[44]. *Id.* at *Guideline 3.*

[45]. *Id.*

[46]. *Id.* at *Guideline 1.*

[47]. *Id.* at *Guideline 2.*

[48]. *Id.* at *Principles for Distance Education.*

[49]. On the World Wide Web, there are at least seven web sites for California law schools utilizing correspondence study methodology. A majority used traditional independent study models. However, several utilized some form of technology. For example, the Abraham Lincoln University Law School webpage states that it provides audio-taped lectures through on-line lectures. www.alulaw.com. The Oak Brook College of Law webpage states that it uses an intensive one-week session with all students and professors meeting in Oklahoma at the beginning of the semester and then relying on e-mail thereafter. www.obcl.edu. At Oak Brook, as well as many other "virtual" law schools, no physical campus exists. Professors at Oak Brook are located in different parts of the country. These law schools are not accredited by the ABA.

[50]. *See* ABA Memorandum D9697-59, Temporary Distance Education Guidelines, *supra* note 37.

[51]. *See id.* at *Guideline 6*, which states:

> **Technology requirements** – Technology of poor quality can be a hindrance to the delivery of a good educational program. All systems will be expected to operate in a manner which will enhance and not hinder education. To that end the law school will be expected, in its request for authorization to conduct an experiment, to describe the technology to be used, the type of facility from which the program will be delivered and the type of facility to which it will be delivered, the bandwidth and other technical information of any video delivery system, the nature of any computerized delivery system, and other related information.

[52]. *See generally*, OPEN EDUCATION: POLICIES AND PRACTICES FROM OPEN AND DISTANCE EDUCATION (Terry Evans & Daryl Nation, eds., Routledge1996). The practicing bar also has been using similar technologies. In *Harrell v. State*, a Florida appellate court upheld a conviction in a case where the victims, who were unable to return to Florida for the trial, testified from South America using a video satellite transmission.709 So. 2d 1364 (Fla. Dist. Ct. App. 1997). The court reasoned that the "face-to-face" component of the Confrontation Clause had been satisfied because the defendant and witnesses were able to interact, the defense attorney had an opportunity to cross-examine the witnesses, and all parties involved were able to observe the demeanor of the witnesses while they testified. Attorneys also have been using video-conferencing to depose and prepare witnesses, to conference with attorneys in branch offices and to negotiate with opposing counsel.

[53]. It is important to engage the services of an architect familiar with video-conferencing. Recently, an architect working on designing new video-conferencing rooms at the Law Center visited one of the author's classes. Prior to class, he asked her what improvements she would like to the room and to the system. After class, he diagnosed some of the problems she had encountered, found a few of his own, and then suggested alternatives for future rooms.

[54]. While having a particular room serve both as a regular classroom and a video-conferencing room might be a fiscal necessity, it is not ideal for the instructor, the students, or the technicians. Video-conferencing rooms need to be specially configured and have appropriate lighting, audio, and video capabilities. Thus, when the room serves a dual purpose, equipment and furniture must constantly be removed or shifted in order to accommodate other classes. Given the startup time that already is necessary for this type of class, the technicians have the added burden of repeating this process each and every time a video-conferenced class is held.

[55]. PORTWAY & LANE, *supra* note 15, at 60.

[56]. *Id.* at 61.

[57]. *Id.*

[58]. Bob Filipczak, *Putting the Learning into Distance Learning at* http://www.lucent.com/cedl/training1.html (last visited Apr. 15, 1999).

[59]. Peter Weinstein, *Education Goes the Distance: Technology Update*, TECHNOLOGY AND LEARNING May/June 1997.

[60]. Rhett Hudson, *DT-5 Enabling Technologies Desktop Video Conferencing*, CURRICULUM 21 SUCCEED 1, 2 (1996) *available at* http://www.visc.vt.edu/succeed/videoconf.html (last modified May 8, 1997).

[61]. *Id.*

[62]. *Id.*

[63]. *Id.*

[64]. *Id.*

[65]. However, some institutions have been using packet-switching successfully. For example, frame-relay technology is being used at Sage College and Albany Medical College in Albany, New York. *See* Helen Leskovac, *Distance Learning in Legal Education: Implications of Frame Relay Videoconferencing*, 8 ALB. L. J. SCI. & TECH. 305 (1998). However, these institutions are using expensive fiber optic lines. In addition, the frame-relay network is restricted to areas having the same local telephone area code, although it is apparently possible to bridge different area codes for video-conferencing purposes. *Id.* at 316, 319.

[66]. An ISDN line has 4-10 times the amount of bandwidth than a regular phone line attached to a computer modem. Royal Van Horn, *Power Tools*, 77 PHI DELTA KAPPAN 646, 647 (1996).

[67]. Some programs, however, need the large bandwidth that fiber optics provides. For example, medical students at the School of Medicine and Dentistry of New Jersey observe open heart surgeries live over a video-conferencing system. In that system, the larger bandwidth of a fiber optic based system is necessary. *See* Filipczak, *supra* note 58.

[68]. Some of the Law Center's International Clinic placement sites, such as in Madras, India, have no ISDN service. When this occurs, the students participate by using audio-teleconferencing.

[69]. *DSL and xDSL (Digital Subscriber Line and its Variations) at* http://www.whatis.com/dsl.htm (last modified Mar. 24, 1999). Telephone companies such as Bell Atlantic, Bell South, US West, GTE, NETinc, and Optimum Communications already are providing DSL-based services to some customers. *Id.* at 2. *See also* Tim Greene, *Cable Net Services Need Work* (1998) *at* http://www.nwfusion.com (visited Apr. 15, 1999). In addition, although not yet available to the consumer, cable companies have the technology to provide dual-directional digital data transfers over cable networks. *Id.*

[70]. *Id.*

[71]. PORTWAY & LANE, *supra* note 15, at 70.

[72]. *Id.* at 70.

[73]. *Id.* at 64.

[74]. *Id.*

[75]. *Id.* at 56.

[76]. In contrast, the entire system is voice activated from site to site. The system will automatically activate the camera at a particular site if there is any noise whatsoever from that site. As a result, the microphone normally should be muted if a site participant is not ready to speak. Once a participant at a site wishes to speak, it will take the system approximately four seconds to switch locations.

[77]. The main system currently in place at the Law Center is manufactured by PictureTel and costs approximately $18,000.00. Each off site system costs approximately $1,200.00 to $1,400.00. While monthly charges vary depending on how many students are off site and the amount of class time required, the average cost is approximately $300.00 per month. An additional one hour on-line set-up time is also required per class. There are several video-conferencing companies to choose from. Among them are ACT Teleconferencing, Compression Labs, Inc. (CLI), Intelect Visual Communications Corporation (IVC), PictureTel, Sony, and VTEL Corporation. *See* Weinstein, *supra* note 59. V.C.I. also manufactures video-conferencing equipment, such as the ERIS system.

[78]. Of course these vary from clinic to clinic. In the Criminal Justice Clinic, for example, the classes are Advanced Criminal Procedure, Advanced Trial Advocacy, and the Psychology of Jury Selection, respectively.

[79]. Plans for new video-conferencing rooms are currently underway.

[80]. Currently, the Law Center covers all ISDN costs and computer shipping costs.

[81]. Nick Eastmond, *Assessing Needs, Developing Instruction, and Evaluating Results in Distance Education, in* DISTANCE EDUCATION STRATEGIES AND TOOLS 87, 97 (Barry Willis ed., 1994). *See generally Distance Education at a Glance, Guide #2,* ENGINEERING OUTREACH (Oct. 1995) *available at* http://www.uidaho.edu/evo/dist2.html.

[82]. A useful "Telelearning Checklist" can be found at http://www.kn.pacbell.com/wired/vidconf/Using.html. Jodi Reed & Merry Woodruff, *Using Compressed Video for Distance Learning available at* http://www.kn.pacbell.com/wired/vidconf/Using.html (last modified Mar. 22, 1999). This article has been published in the Fall 1995 issue of THE DISTANCE EDUCATOR newsletter.

[83]. Eastmond, *supra* note 81, at 97.

[84]. *Id.* at 97-98.

[85]. *See* Chart 1.

[86]. The number of students at the distant sites varies greatly from clinic to clinic and from semester to semester. Many students choose their placements based on where they consider "home." Thus, it is entirely foreseeable, that in any given semester, that as many as half of the twenty-five students in the Criminal Justice Clinic could be at distant sites. To date, the Criminal Justice Clinic has had a maximum of seven out of twenty-five students at distant sites.

[87]. If this system is to be implemented then it should be utilized in an interactive way. Otherwise, it is the educational equivalent of a videotaped lecture.

[88]. E. Lynn Oliver, *Video Tools for Distance Education, in* DISTANCE EDUCATION STRATEGIES AND TOOLS 165, 184 (Barry Willis ed., 1994).

[89]. Reed, *supra* note 82.

[90]. *Id.*

[91]. The computerized document stand does not require the use of transparency film. Plain paper can be written on and the image will be displayed upon the television monitor.

[92]. Eastmond, *supra* note 81, at 97.

[93]. Oliver, *supra* note 88, at 177-78.

[94]. *Id.* at 178.

[95]. *Id.*

[96]. *Id.*

[97]. *Id.*

[98]. *Id.*

[99]. Because of the design of the classrooms, the perspective is unlikely in the classroom setting.

[100]. Oliver, *supra* note 88, at 178.

[101]. *Id.*

[102]. In true television production, a long shot contains an entire body, head to feet, and much of the subject's surroundings. A medium shot contains most of the body including the head and torso. *Id.*

[103]. *Id.*

[104]. Students report that they can "hear" better when they see the speaker up close. It is not surprising as the same thing occurs in live face-to-face instruction. In a sense, sighted individuals are lip readers to a certain degree. This seems to be more important with this type of technology. In part, this may occur because there is inevitably other noise that the sensitive microphone can detect and send out to the distant sites.

[105]. An instructor utilizing video-conferencing should be as familiar as possible with the technology. Troubleshooting only becomes easier after having gone through a number of technology mishaps. Moreover, technicians can come and go. Without an institutional memory of past problems, even the most technologically competent novice technician cannot compete with experience.

[106]. This would include for the most part practice in controlling the direction of the cameras, the best distance for the zoom lens, and the mute buttons.

[107]. Before using the technology it is important to train the students with the equipment. It is worthwhile to connect to another site and let the students practice using the system while they are all on the same location. This would also be a good time to set and practice the protocols that will govern during real classes.

[108]. *See* Michael P. Lambert, *Keeping Fixed on the Objective: Reflection on Distance Education's Future*, 10 AM. J. DISTANCE EDUC. 59 (1996).

[109]. John E. Sexton, *The Global Law School Program at New York University*, 46 J. LEGAL EDUC. 329

(1996).

[110]. *Id.* at 329.

[111]. *Id.* at 330.

[112]. Carol Twigg, *Navigating the Transaction*, 29 EDUCOM REVIEW No. 6, 1, 18 (Nov./Dec. 1994) *available at* http://www.educause.edu/pub/er/review/reviewarticles/29620.html.

[113]. *See generally* PORTWAY & LANE, *supra* note 15 (stating that a number of psychological barriers to the use of educational technology generally exist in academia).

[114]. *Id.*

[115]. *Id.*

[116]. *See* Jeanne E. Gullahorn, *Technology-Based Distance Education: An Introduction*, 31 CGS COMMUNICATOR No. 5, 1 (May 1998).

[117]. *See id.*

[118]. *See* Carol Beere, et al., *The Impact of Technology on Graduate Education: Opportunities and Challenges for the 21st^t Century*, 31 CGS COMMUNICATOR No. 5, 7 (May 1998).

[119]. *Id.*

[120]. See Leslie M. Thompson & John F. Schmitt, *Redefining the Academy: Can Distance Learning Technologies Help Graduate Education Promote Socratic Ideals?*, 31 CGS COMMUNICATOR No. 8, 10 (May 1998).

[121]. Technology should "enhance and not hinder education." ABA Temporary Distance Education Guidelines, *supra* note 37.

[122]. *Id.*