Digital Shakespeare projects did not exist when I arrived at MIT 30 years ago, and I was not an early enthusiast of the initial text-based phase of humanities computing that began somewhat later. My own education had stressed the distinctiveness of the humanities and its methods. I did not want to “build bridges to technology,” as some MIT humanities faculty did, but to offer my students something of the excitement and challenges of literary study I had experienced as an English major at Columbia University and later at Cambridge. In both institutions, literary education was intense and somewhat militant about literature’s power to change the world and skeptical about the value of bridge building. In answer to C. P. Snow’s *Two Cultures and the Scientific Revolution*,¹ which detailed the split between science and technology on the one hand and the humanities on the other, F. R. Leavis, one of my Cambridge teachers, had written *Two Cultures?: The Significance of C. P. Snow*,² launching one of the bitterest academic
feuds of the time. In addition, the field of English studies was not then as hospitable to film and media as tends to be the case today: the curriculum was almost exclusively text based. But in Shakespeare courses performance-based teaching methods were already beginning to supplement the text-only approach, and I was eager to use and extend them. When computer-directed video made it possible to link text to filmed performance in the mid-1980s, my conversion to educational technology was rapid.

Over the past decade or so, the Shakespeare Electronic Archive group at MIT has become one of the leaders in creating multimedia archives and electronic environments for Shakespeare teaching and research. The archive now includes a rich collection of electronic texts, high-resolution digital images of early editions and works of art, and several films. *Hamlet on the Ramparts* presents a selection of these materials free of charge on the World Wide Web. We are adding production photographs and other images from the collections of the Royal Shakespeare Company and the Shakespeare Centre Library. We also plan to include many of these in MIT’s OpenCourseWare (OCW) site. Further, with support from the MIT-Microsoft iCampus Initiative, we have developed a Cross-Media Annotation System (XMAS), making it possible for the first time to include real-time video citations in online discussions. In this chapter I combine a brief history of our work, including discussion of lessons learned and questions still to be answered, with a more personal account of how my hopes for the project emerged in the course of trying to extend the close
reading practices I had learned as a student from the realm of text to that of image, sound, and film.

The Shakespeare Project

Close reading, or “practical criticism,” involves sustained attention to details of a manageable passage of text (a short poem, for example, or an extract from a novel or play) in quest of an interpretation or “reading.” It has many forms, but common to most are the ideas that interpretation must be based on specifics of the text that one can point to as evidence for a reading and that group discussion plays an essential role by confirming, revising, objecting, expanding, or finding alternatives to an interpretation. In one well-known formulation, the academic classroom thus becomes an “interpretive community.”

My aim was to apply this style of education to performance materials as well as text, which proved difficult. Shakespeare’s plays were scripts for performance first and literary texts only secondarily. Film—especially multiple film versions of a single play—offered the possibility of close study of one of the most central aspects of Shakespeare’s work: its open-textured quality. Though sometimes called “universality,” I prefer to think of this quality as Shakespeare’s seemingly limitless power to inspire divergent interpretations across time and cultures and believe this can best be understood through group discussion of text and film in conjunction—with evidence and examples available during the class hour for consultation. My goal was
to render the complex interplay of text and performance legible—something a class could read as closely and carefully as they were learning to read sonnets and soliloquies.

Evening showings of films—at first in 16 mm rented prints—were of some help, but the discussions that followed did not come close to the give and take, the formulation and revision of views in response to shared pondering of the evidence, that text enabled. The books we held in our hands were rich in invitations to specificity. Printed words on paper, page numbers, act and scene indicators, marginal line numbers, and margins to write in—all gave us something to point to, to work through, and to make our own. Film showings did expand students’ sense of the possibilities inherent in the text, but not with the same feeling of having arrived at a deeper, more secure, and shared understanding. In the end we watched the films and talked about them a bit, but we studied the text.

The first technology to offer a partial solution was the now obsolete CED videodisc system, which I bought initially not for the classroom but for home use in the hope that my children would find it an acceptable substitute for television. The system was a predigital, prelaser electronic device that played 13-inch discs with a stylus, like LP records. Available titles included classics we thought would be fun to watch: *Modern Times, City Lights, The Thirty-Nine Steps, Some Like It Hot, The Apartment, Casablanca, The Big Sleep,* and so on. We were slightly surprised to find that our strategy was effective. Active family conversation about the films we watched in this medium actually did edge out television watching (with the ex-
ception of Saturday mornings), in large measure because there was a minute counter, and thus the stylus could be repositioned quickly enough to replay key passages and sustain discussion. My eight-year-old daughter was the most avid participant in the group. We encouraged her to stop the machine whenever she had a question. After we watched The Big Sleep—which has a particularly puzzling narrative line, even for grown-ups—she preferred to write out a short list of crucial moments to be discussed on the next viewing. This is a frequently remembered moment in our family (Emily is now a high school teacher and curriculum developer), and it is also one that marked a turning point for me. I bought the first few Shakespeare discs published on CED when they came out, asked the department head for funds for equipment, and began to use film in my classes in a much more flexible way. With the help of a few key start points written on an index card, the medium permitted rapid enough access so that materials could be selected on the fly, in the course of a class hour, and in response to the ebb and flow of discussion.

I also began to think about a comprehensive system in which a student or teacher could find the right place in any Shakespeare-related material—text, image collection, and film. Early computer-directed laserdisc projects at MIT’s Media Laboratory, such as the Aspen Movie Map, in which a user can simulate a drive through the city of Aspen, Colorado, turning at will at intersections, suggested a technological solution (computer-directed laserdisc) to the problem of text/film juxtaposition and also provided the crucial metaphor of navigation.
through an information space. I wanted my students to be able to explore the Shakespeare domain in a roughly analogous spirit, moving through the world of Shakespeare’s plays and their afterlife across media and culture, turning where they wished in a clearly mapped environment.

The core vision for the MIT Shakespeare Project was thus inspired by the Media Lab’s experiments with navigable video environments and by my daughter joining the family conversation about movies with serious questions to ask at a precocious age. The Movie Map pointed toward a navigable archive; the success of CED, toward a version of group “close reading” in the multimedia domain. In 1992, Janet Murray, Larry Friedlander, and I collaborated to begin the Shakespeare Electronic Archive. Murray, now at Georgia Tech, was director of MIT’s Athena Language Learning Project at the time, and Friedlander, who had already completed a pilot version of a project that linked several Shakespeare scenes on film to text at Stanford, came to MIT as a visiting professor to work with us. We wanted to create an archive in which all Shakespeare materials in any medium would be quickly available from corresponding lines of text, and we wanted students to be able not only to find but to rearrange materials and use them in their own presentations and in essays incorporating pictorial and video evidence. We started with a seed grant from Steve Lerman’s post-Athena multimedia group at MIT and applied for two National Endowment for the Humanities (NEH) grants: one for a text-video system to use in the classroom, and one for a prototype archive that would include multiple texts, images, and films.
Though our vision was a unified one, we quickly learned that both copyright questions and technical requirements made a two-pronged strategy necessary. Ten years later, intellectual property restrictions and the difficulty of doing everything we hoped to do in one integrated system are still among the major obstacles to realizing what we first envisioned. Nonetheless, we have made steady if uneven progress toward the goal of a comprehensive Shakespeare archive flexible enough to support spontaneous discussion as easily as scholarly research.

HyperCard/Laserdisc System

Our first major project was a text-video system for the classroom, using video laserdiscs and HyperCard. Laserdisc—unlike DVD—was designed with third-party educational use in mind, either using a barcode system or, as in our case, software tools that could be modified by users, to access specific points on a disc and link those points to electronic texts displayed on a computer screen. We created links between the text of Shakespeare plays—about one link for every three or so lines of text—and the time code of the discs so that a student could click on a speech and watch the corresponding film sequence in which the lines were spoken. About 25 Shakespeare films had been published on disc when we began, and the number grew to more than 40 by the time we completed the project. The titles included some of the most useful films for educational use, with multiple versions for many plays (including the
Olivier, Zeffirelli, and later the Kenneth Branagh versions of Hamlet; the Orson Welles and Polanski interpretations of Macbeth; Akira Kurosawa's Throne of Blood, a recasting of Macbeth in the Samurai genre that is one of the most critically acclaimed Shakespeare adaptations; and the Cukor, Zeffirelli, and Luhrmann Romeo and Juliet films. Using stacked players, we could compare different versions to one another and to the text. In addition, we created software “note cards” that allowed students to define their own film sequences and include links to the video in their own notes, presentations, and multimedia essays.

This exciting new tool confirmed our belief that studying text and moving images in close conjunction could lead to something different from studying either medium by itself. Students’ use of visual evidence could be precise and copious. In showing how a performance enacted text, students were not limited to what they could remember or even to what they could describe in words—they could show complex meanings unfolding in time in the course of a scene. In my teaching I encouraged this ostensive rather than descriptive method, asking them first to find material that interested them, and then to formulate their ideas about it. Perhaps most important, as they pursued new kinds of topics, their work in the new medium seemed to move away from the clichés of term papers.

One of the best papers/presentations was on the hand gestures in Laurence Olivier’s Henry V. The argument was on the surface a very formalist one. The students tried to create a typology of repeated gestures in Olivier’s repertoire—the wel-
coming embrace, the imperious finger point, the palms-reversed gesture of outrage. They found 17 varieties and gave examples. They further argued that in key scenes—turning points—Olivier ran through at least five of these in a 30-second period. At first, such an exercise might seem overly quantitative. But in *Henry V*—Shakespeare's as well as Olivier's—the king is a performer. He can rise, spontaneously, to occasions such as a direct challenge to his authority, the discovery of treason, the need for a speech before an important battle, or wooing the French princess, but in doing so he relies, in the text, on deliberate, even obvious, rhetorical strategies. Each production of the play must decide how to present his partially visible performance techniques—and these decisions will determine, in part, whether the emphasis falls on Henry's spirited improvisation or on his Machiavellian management of his image. In either case, the king is also an actor, a player-king, and students Jean Hsu and Grace Lee were able to show how Olivier found visual analogs for his verbal rhetoric. My role as teacher began to shift as I used the new tools and encountered student papers such as these: the classroom became more like a workshop, as students helped each other edit material or offered critiques of preliminary versions of presentations.

Laserdiscs are now no longer manufactured, and the initial expense of equipment (a computer, two high-end disc players, and a small library of discs) limited dissemination even while the technology was current, but this early system served several purposes. Importantly, like the Aspen Movie Map, it served as a “proof of concept.” It was actively used at MIT and...
collaborating institutions, including the University of Vermont, Stanford, the Folger Summer Institute for Teachers, and Vassar College. The laser system helped launch a new pedagogy and introduced copious video citation to the scholarly world. In the second year of the project, I presented the first analytic text-video paper at the Shakespeare Association of America (SAA); we have presented new interpretive work at most SAA meetings since and at the founding meeting of the British Shakespeare Association. The multimedia essay is now a well-established form for scholarly communication in Shakespeare studies, and we have continued to contribute to the evolution of this form.

Laserdiscs provided a high-quality, computer-addressable video source that also offered a solution to the problem of copyright. Because discs were purchased for use in the system and not copied, permission was not needed. Indeed, laserdiscs were marketed with educational use in mind, and some manufacturers, such as the Voyager Company, also produced basic software for computer control that could be modified and expanded by educators. Although we have been able to transfer all of the essential features of the LaserDisc project to our current DVD-based system, including all of its manual text-film links, it is important to note that one of its advantages—its openness to educational use—has not carried over into DVD. The educational potential of DVD is great: the discs and players are less expensive, and DVD drives are now commonplace in desktop and laptop computers. But the technical design of the medium is proprietary and restrictive, protected by some of
the strictest provisions of the Digital Millennium Copyright Act. We have found effective ways to work with DVDs while respecting both software and content copyright, but it is significant that many educators now regard it as a settled matter that DVD functions and features are and will remain under the sole control of the producers.

Shakespeare Electronic Archive

Our second major project was the Shakespeare Electronic Archive, begun under NEH funding and continued with a generous grant from the Andrew W. Mellon Foundation. The need for a Shakespeare multimedia archive was widely recognized in the field. Shakespeare materials exist in greater profusion and across a broader range of media than those available for any other author. These include early printed books, critical commentary, and illustration that began in the 1590s (if we count the Peacham drawing of Titus Andronicus). Sound recordings of Edwin Booth reading lines of Othello were made as early as 1890. The film tradition began in 1899, with Herbert Beerbohm-Tree in the death scene from King John, closely followed by Sarah Bernhardt’s performance as Hamlet in the duel scene for the Paris Exposition of 1900. The number of Shakespeare films made in the silent era alone (the existence of silent Shakespeare is a surprise to some) is in the hundreds, and many survive. Film production continues through the current and impressive “new wave” of Shakespeare film that began with
Branagh’s *Henry V* in 1989; two separate productions of *The Merchant of Venice*, one with Al Pacino in the title role and the other with Patrick Stewart, are scheduled for release in 2004. Theatrical records—promptbooks, playbills, photographs, reviews—are also plentiful. Shakespeare is studied and performed on every continent. Yet individual collections tend to be complementary and need to be brought together; images and film need to be juxtaposed with the texts they enact or interpret.

Our immediate aim was to create a prototype archive that crossed a wide range of media—multiple electronic texts, page images in digital form, art and illustration, and some film. This exceeded the limits of HyperCard considerably and presented somewhat different intellectual property issues. The page images and artwork we wanted to use were owned by rare book libraries. Unlike the film studios, the largest Shakespeare libraries in the United States—the Folger and the Huntington—were willing to allow us to use their materials, but with restrictions—at first to stand-alone workstation use and later to password-protected use on the Web. We began by identifying key materials to span the period from the first quartos to the present. The First Folio was the obvious choice—this is the first collected edition of 1623, published after Shakespeare’s death by his fellow shareholders in the King’s Men, his theatrical company. There are 220 extant copies of this edition, of which 80 are owned by a single institution, the Folger Shakespeare Library. To create as complete a record of the edition as possible, we included high-resolution images of every page, as well as images of every variant state of pages for which they ex-
ist. To do so, new scholarship by Peter Blayney, the foremost expert on the Shakespeare Folio, was commissioned to identify variants and select “best” copies to photograph.

In addition to the Folio, the archive now includes copies of most of the early quartos of Shakespeare's plays. For Hamlet, which exists in three distinct early versions, we decided to digitize not only representative pages but also all extant first and second quartos in full. For Hamlet we also photographed 1,500 works of art and illustration, and several films—the 1913 Forbes-Robertson version, the Ragnar Lyth version of 1984 (in Swedish), and the Richard Burton theatrical version of 1964. In these cases we were limited principally to films for which we could obtain permissions, and these will likely remain few. Thus, for Hamlet at least, the archive contains multiple versions of the play across media: a complete record in electronic text and facsimile of variation among early editions; multiple electronic texts; films; and for many lines of the text several—even dozens—of artists' representations.

Though scholars have been concerned with textual variants in Shakespeare since the early eighteenth century, the divide between specialized knowledge and what has traditionally been taught about Shakespeare has been great. This is in part a consequence of the form of the printed book and the specific design traditions of the “authoritative” edition, in which textual variants are relegated to tiny footnotes, endnotes, or appendices, and even, in the case of the Oxford Shakespeare, to a separate volume. But it is important for all students to know that books in Shakespeare's time were very badly set by compositors
working quickly and to know something about the consequences of this and other details of the history of the early printed book. When, at the opening of The Tempest, the first play in the Folio, the master speaks the very first word—"Boatswain!"—as the ship begins to sink, the compositor first set the great ornamental capital “B” upside down. This was later corrected, but few pages, even uncorrected ones, were thrown away in the early seventeenth century—all the copies of the Folio we have are a mix of corrected and uncorrected pages.

Sometimes these variants within an edition make a difference in the meaning of the text. For example, later in The Tempest, Ferdinand praises Prospero, the sorcerer-king of the island and his father-in-law to be: “So rare a wonder’d father and a wise makes this place paradise.” But in 1978, Jean Addison Roberts found six Folger copies in which the reading seemed to be “wife,” not “wise,” and study of the material text at the most minute level became in this case imbricated with debates in the field over the status of women in Shakespeare. “Wife” and “wise” are examples of variation within a single edition; differences among editions can be more profound still, as they are for Hamlet, King Lear, Othello, Romeo and Juliet, and a number of other most frequently taught plays. The Folio’s “To be or not to be, that is the question” is “To be or not to be, aye there’s the point” in the First Quarto. The death scene of Lear is far bleaker in the First Quarto of that play; Juliet’s last words have two forms, and neither seems a mistake: in the Second Quarto she says, “O happy dagger, this is thy sheath/There rust and let me die.” In the First Quarto she says, “Rest in my bosom, thus I
come to thee," an ending perhaps less despairing and perhaps less frenzied, one that anticipates Cleopatra’s last words in the much later Antony and Cleopatra. In some instances scholars can make a very good case that one or another reading is closer to what Shakespeare wrote (no manuscripts survive for the canonical plays). In other cases, it is much harder to guess, and for some plays there is the possibility, even the likelihood, that variant readings represent the author’s “second thoughts.”

These questions regarding meaning are well known to scholars, but in the past the fundamental facts concerning the variation and the instability of Shakespeare’s text seldom survived the passage from specialized knowledge to undergraduate education. The current generation of Shakespeare teachers, however, is for the most part intent on making these things clear in the classroom. A digital archive can contribute access to the full range of texts and variants, making it possible to juxtapose different versions on the screen—without making all but the preferred edition impossible to read sequentially. One might (but no one ever does) sort out the fascinating differences between the 1622 Quarto of Othello and the Folio, which differs in hundreds of single word readings, by consulting the back pages of The Riverside Shakespeare or the Oxford Textual Companion, but it is impossible to read the 1622 Quarto by this method. There have been many attempts to combine comparative and sequential reading in the domain of print and paper. The most ambitious of these includes The Complete King Lear, edited by Michael Warren, in which facsimiles of three editions are presented on facing pages, with the complete texts of
each in unbound fascicles. With this publication, Warren felt that he had exhausted the potential of print to represent the early texts of Shakespeare. He became our active collaborator for several years, traveling to the six research libraries in the United States and the United Kingdom that own copies of the First or Second Quartos of Hamlet and confirming the accuracy of each of our slides by comparison with the original.

Art work also presents alternative versions of a play, and though most lines of a given play are never illustrated, traditions of representing key moments and prominent performers offer a glimpse into how the plays have been performed and interpreted. For the Hamlet art component of the archive we joined forces with Alan Young, who was writing a book on the subject, and agreed on a plan for sharing images. Young shared his work in progress with us, including identification and description of 1,500 images from the Folger Library alone. We arranged for photography and digitization and included the images and his database in the archive, providing him with photographic as well as digital copies to use in his own work. We linked all images to the lines of text Young specified.

In one case more than 100 images illustrate a single line: “Alas, poor Yorick, I knew him, Horatio.” If one examines these images as a group, they tend to fall into groups—some with Hamlet alone in the image, meditating on death, the skull linking this secular play to medieval and ancient traditions of memento mori. In others, the representation is highly social, with Hamlet, Horatio, and the two gravediggers all attending to the skull and to Hamlet’s recognition of it as that of an intimate
childhood presence, now long lost. There are nuances in the “Yorick” group, of course, and much more that might be said about them than I have said here. Students can, as they could not before, examine all of these images in preparation for a class on the scene, juxtapose them with one another and with the text(s) of the scene, draw their own conclusions, and (if they have the right plug in) compare the still images with several film versions. The archive is now in use as a workstation at the Folger Shakespeare Library, the Shakespeare Institute, and MIT. There is also password access on the Web to a version that includes most of the materials. The current arrangement allows for access to 25 institutions that agree to use the archive in their classes and report back on its use. In addition, a sample of the archive in a faster-loading form is available for two key scenes as Hamlet on the Ramparts.

In a recent call for proposals for the Digital Libraries Initiative, we proposed expanding this strategy of creating a high-resolution archive with sample scenes available without charge on the Web from Hamlet to other plays, eventually to all of the plays. In this way, participating libraries could make a clear contribution to education without having to allow all materials to be accessed on the Web in high resolutions. For this effort, we assembled an impressive list of major scholars and sponsoring and participating institutions—the Folger Library, the Huntington Library, the University of Pennsylvania Library, and the Shakespeare Institute Library in the United Kingdom. We were not among the projects funded, but development of a multi-institution, collaborative Shakespeare archive still seems
an ideal worth pursuing. Just as we try to sift, sum up, and collect the best textual scholarship in creating new print editions, a digital archive that brings together complementary collections seems the first order of business. Further, the comanagement by a project team and the owners or copyright holders for key materials and collections seems the best way to build something that will be lasting, even while intellectual property issues and the question of the market value of different kinds of resources remain unsettled.

Not having secured funding for a very large enterprise such as this, however, we shifted our immediate strategy toward working with institutions that will make materials free to all on the Web at the outset. Among these is the University of Pennsylvania, whose Shakespeare collections rank in the top three in the United States and whose digitization policies are extremely generous. We have also begun several projects in collaboration with the Royal Shakespeare Company (RSC) and the Shakespeare Birthplace Trust. The first of these is a prototype of a new kind of performance archive in which materials are actively collected during the planning and rehearsal process, and archiving continues through the theatrical run and beyond. Another pilot project involves digitizing several hundred images from key productions for use in the archive and on the Shakespeare course pages of MIT’s OCW initiative. (Many readers will be familiar with this initiative and its ambitious goal of making all or nearly all MIT course materials available freely on the Web.) Our hope is that MIT’s approach will influence other institutions; the Royal Shakespeare pilot is
an example of just that. Many institutions today are uncertain as to what their permission policy should be; they are especially concerned about losing potential income that digital distribution of materials might produce.

As we discussed the archive project, it looked at one point as if the plan would have to be shelved unless we had, as one RSC manager put it, market research showing that this was the best path. That might have ended the planning, but MIT as an institution had conducted extensive research about the prospects for various kinds of for-profit and nonprofit Web initiatives before deciding to launch OCW. The faculty committee concluded that making materials available without charge was the best course and consonant with the historical mission of the university. That did not mean that no for-profit activities would be launched, but rather that they would be individual or program efforts in addition to the massive institutional effort to contribute to the digital commons. This argument was persuasive at the RSC. Other MIT faculty seeking image permissions from libraries and other collections have had similar experiences. OCW is one example of the attempt to shift the intellectual property landscape by reviving the idea of the public good; we need others.

Stanford University/MIT Shakespeare

On the classroom tools side, we have moved from laserdisc stand-alone systems to the Internet. The small discussion class,
with a passage of literature at the center of discussion (the “close reading” model) remains the inspiration here. Along one axis, the short poem or the short passage from Shakespeare becomes an “expanded text,” extending across variation and media forms—but that expanded text requires good software tools to make it manageable and accessible to the class. Along another axis, the classroom itself may now extend over space, as we find ways to capture essential features of the intimacy of the small class in remotely shared discussions and collaborations.

Our first experiment with “real time” remote discussion with the materials chosen during the class hour was the Stanford University/MIT Shakespeare Project, in collaboration with Larry Friedlander’s Shakespeare class at Stanford in 1996. For this, Larry Leifer’s design group at Stanford developed software for embedding laserdisc commands in Web pages that could interface with our text-laserdisc system. In the pilot project we focused on “live use” during a single class—with lots of prior preparation. The classes were connected for several sessions through a primitive (CU-See Me) videoconferencing window so that we could get to know one another. Both classes were studying Shakespeare using the laserdisc system, and in the culminating class we attempted to have a remote discussion in which both clips and comments would be generated during the two-hour class. The Stanford students began by offering their interpretation of a brief sequence of film, and the MIT students were to confer, discuss, and reply with comments and clips of their own, continuing the discussion with the Stanford class while one student found and “sent” the clips
that constituted our evidence. But we ran into an unexpected problem. Though we were using the same discs produced by the same manufacturer, one of them had a different and longer credit for disc production in the prefatory material, which threw all the time-code citations off kilter. One of our students timed the difference between the two versions, wrote a few lines of code to correct for it, and the experiment “worked”—a bit belatedly. A big cheer on the tiny CU-See Me window went up from Stanford when our clips played on their machines, but we realized that the “video-enriched” remote conversation about Shakespeare we had just witnessed needed another technical platform.

Cross-Media Annotation System

The basic idea of remote discussion incorporating video developed into our major project over the past three years, XMAS—one of the launch projects for the MIT-Microsoft iCampus Initiative. In the first phase, the Shakespeare Project team wrote the specifications and served as testers and first users, but the programming effort was located principally at Microsoft’s headquarters in Redmond, Washington. We planned a system that would look like a bulletin-board style discussion but would also include two video windows on screen, each with editing controls, so that streaming video passages could be inserted into student comments. For this first version Microsoft provided a great deal of highly skilled programming time, and
we created a system that was used in MIT classes and for a Shakespeare Association of America remote seminar for faculty members writing about Shakespeare film. Use at MIT was successful, and those of the distance seminar participants who could establish a good connection experienced a new kind of collaboration. Indeed, several subsequently published papers came out of these discussions. But not everyone could successfully connect to the servers in Redmond, and high bandwidth was required.

There were other problems too: the MIT project staff had no access to the code and therefore could not troubleshoot problems. In summer 2002, Microsoft extended its grant for 15 months, and we jointly decided to shift the programming effort to the MIT side. This was an immense challenge, especially because Microsoft was no longer supporting the underlying annotation system we had been building on. Although the goals of the project and the interface designs were usable, software development had to start over. For this effort we concentrated on DVD video. As I mentioned earlier, the DVD medium is more, not less, difficult to integrate into computer-directed systems than laserdisc. The complex menus and initializing routines that are a minor annoyance to consumers reflect an underlying structure that limits modes of access to what is on the disc to set pathways, so that, in creating a system that links user comments or Shakespeare text to any part of the disc, in a sense we have to work against the grain of the medium to make use of its random access potential. But, as with laserdiscs, we do not copy the disc or change it, and we pur-
chase the discs we use with the system. At this point, more than a hundred Shakespeare titles have been published, including the BBC series that includes a made-for-television production of every play in the Folio.

The MIT team rose to the challenge, and this has been the most exciting of my more than 10 years on the project. On the content side, we now have a highly experienced graduate of the Shakespeare Institute in Stratford and several MIT staff members with experience in drama and film who work several hours a week. Our technical director has been a part of the project since she was an undergraduate. We hired a graduating senior in computer science as the lead programmer, with an MIT senior as the second programmer and two UROPS (undergraduate research students) who will phase into major roles as the older students graduate or depart for industry jobs. Progress has been gratifyingly rapid, partly because there is constant communication among the staff members, with very strong integration of the humanist and technical side of the work, and partly because we work in the MIT Center for Educational Computing Initiatives, directed by Steve Lerman, and can draw on the resources and skills of the larger laboratory when we need them. Further, MIT's traditions of student involvement in faculty research and its exceptionally open and flexible tradition of finding border-crossing ways of supporting faculty projects have been essential to our progress. The MIT model of project-based education, working in (relatively) nonhierarchical teams that integrate disciplines and skills across boundaries, is a powerful one.
We began to use XMAS in our Shakespeare classes in fall 2002. We have only begun to explore and refine the array of enhanced possibilities it presents. As with our laserdisc system, students can include links to video (and now image collections) in their work. Additionally, the system is networked and so supports distributed and remote communication. Among the new forms are:

- Online assignments that incorporate text as well as video examples. Just as we ask students to comment on a passage of text, we can now quickly write assignments in which video passages to be commented on can be played on screen by clicking on a link. Students can use the reply function to complete short assignments, including their own video evidence.

- Online tutorials and comments on student work. Student work can be presented in class, then opened to the group for online comment.

- Students can collaborate remotely on presentations or multimedia essays.

- A record of student work, and the work of the class as a whole, can be preserved on the server along with the supporting image and video material.

Nearly all of my Shakespeare classes now begin with a brief student presentation setting out a question for discussion and illustrating performance issues using film examples. For every
play, all students make notes with video clips, using XMAS. My assignments increase in length and complexity, culminating in 20-minute final project presentations with an accompanying term paper in hard copy. One of the most impressive advantages of the new system is that student or instructor comments on works in progress can take the form of media-rich documents, continuing the conversation initiated by an assignment. Another—extending the advantages of earlier phases of the project—is that students are strikingly willing to follow difficult to track but important turns of meaning that unfold not in words but in the details of performance. Some of these patterns of action and character interaction are new, and many have not been mentioned in the now extensive literature on Shakespeare film, while others, such as reversals and recognitions, have had names since Aristotle’s *Poetics*. Now students can discover and communicate the intangibles that give such terms force and meaning in performance.

In its current version, XMAS supports a broader range of media: text and DVD video, but also image collections (with the ability to crop images when inserting them into student work) and URLs. We now have discussion, annotation, and collaboration tools that can be used with the materials in a comprehensive digital archive and are a step closer to achieving the goals of the projects we began in the early 1990s. Next steps include extensive educational assessment, use with collaborators, and extension to MIT courses outside the Shakespeare domain, including film analysis courses, distance semi-
nars on the cultural reception of major films in the United States and Asia, and any subject area in which looking closely at film and text in conjunction can play a role.

Conclusions

A number of key themes emerge from this narrative of a humanist’s engagement in education technology at MIT. The first two concern MIT’s role in the process. The final two concern the effect of digital tools on Shakespearean scholarship and, more broadly, the potential they hold for all humanists:

The Two Cultures

Whether one calls it a “culture” or not, the MIT environment has been a superb, perhaps unique, place for a humanist not only to learn about how things are done outside the humanities but also to participate—a place for faculty as well as students to “learn by doing.” For this education I am deeply grateful. I raise the issue, though, not primarily to express that gratitude but to recommend MIT’s model as an important one for other institutions to adopt. The model is especially important in the digital age because, unlike other periods, digital technology is, in a fundamental way, different from earlier technologies and permanently intertwined with the ways in which we receive information and communicate and is therefore impossible to relegate to the background.
For a humanist, digitally inflected, convergent, ever-changing media are not only the tools we will have to use but also the subject of our studies of culture and the narrative and expressive arts. A good literary scholar learns about the history and technology of the book; a film scholar often acquires a working knowledge of the cinematic apparatus. But the changes these media experienced during most of their histories are slight compared to the changes in almost every medium, individually and in their inevitable blending, in the digital age. MIT has offered great advantages—an environment in which border crossings are the norm; where new projects are encouraged, space found, and teams assembled more easily than at many other institutions; and a tradition of closely knit project teams in which content, design, and programming are tightly connected and in which staff, faculty, graduate students, and undergraduate students meet and communicate frequently and freely.

Intellectual Property

When I began to work in this area, intellectual property problems were principally technical. They no longer are, but they have proved more difficult than we imagined. Indeed, in the past decade, the notion that scholarly and educational use is privileged has been losing force both legally and in the public mind. In our work we have found many ways to adapt to that environment, such as using modular and purchasable video sources and building prototype archives whose future path to
full public access was uncertain. Each of these partial solutions has led to exciting work, but also to impasses in dissemination. While our current strategy involves working only with image materials we can disseminate on the Web, the intellectual property issues for humanities collections seem larger than any interim solution, linked to the larger shift in social and legal attitudes toward education and the university in particular. I have been impressed by the effect of my institution’s resolve to counter the trend and reaffirm, through the OCW initiative, a commitment to the public good. This has been extraordinarily energizing within MIT, and there are signs that this initiative is having an effect on the national and international conversation on intellectual property. Efforts such as this are critical for the digital future. They may not provide a comprehensive answer, but they are part of the solution.

Shakespeare on Film and Media Education

Before I began to work on the Shakespeare Electronic Archive, I had published what was then one of a very small handful of books on Shakespeare on film—which seemed, at the time, a kind of sidebar to Shakespeare studies. Now there is almost no Shakespeare conference at which film and performance approaches do not have a major place, and many conferences are devoted entirely to such approaches. The number of books in these fields has grown into the hundreds in just 10 years, with the major and most reputable academic publishers publishing a good fraction of the total. Traditionally, there were textual
studies (highest status), interpretive and historical studies and, last, studies of the “influence,” “afterlife,” or “adaptation” of Shakespeare. In the past 10 years, however, it has become much more common for Shakespeareans to understand these areas of research as central to the field, as the model of “original” and “adaptation” has given way to one that recognizes the dialogue between contemporary cultures and the literary past as itself worthy of study.

What I practice in my teaching, and look to digital collections and tools to help me practice more effectively, is a form of education in contemporary and new media that at the same time is also the study of the most canonical and enduringly international of authors. To make the types of connections that need to be made—comparing, for example, Kurosawa’s magnificent versions of Macbeth and King Lear, or Grigorii Kozintsev’s Hamlet or Lear to the films of English, American, or Australian directors—digital tools are key and allow teaching to take a step further toward the ideal of reaching across cultures and across media. The importance of many modes of media education is increasingly acknowledged, but it is not always recognized that the rapidly growing number of Shakespeare, film, and media courses can make a special contribution to this area.

Beyond Shakespeare

My recognition of the value of media education and my attempts to be actively involved in finding technical solutions to
scholarly and educational needs have convinced me that all humanists need to do this. Not all will devote as much time to the effort, but none should be passive about technology or new media. Because digital technology is fundamentally fluid, the media we work in need to be designed and redesigned, and humanists must be involved and recognize the work as a part of their calling.

At MIT, we are in the fourth year of a project to further this goal. The MetaMedia Project is both a software framework project, aimed at making it easier for humanities faculty to create and use multimedia resources, and also a faculty outreach effort. The project is organized around an extensive software development effort and the creation of “mini-archives” in more than a dozen humanities subjects. These small collections are developed by our team, including faculty with long-term projects of their own, graduate students in comparative media studies, programming staff, and undergraduate researchers. We begin discussions with faculty who have identified a teaching need that could be addressed by the availability of archival resources in digital form. The aim is not to build a comprehensive collection, but to bring together materials for a specific unit—perhaps a week or month of instruction—and to create a small collection to address the need, tailoring interface design and functionalities to the task at hand. Thus far we have developed such units for Arab Oral Epic, Melville and Multiculturalism, Early American Comics, German and Spanish language and culture, and American Dance, and are now working with faculty on units on the Declaration of Independence and
American television. This is one important way to move forward on my closing recommendation—that all humanities faculty be involved in multimedia design.

ENDNOTES


2. F. R. Leavis, *Two Cultures?: The Significance of C. P. Snow* (New York: Pantheon, 1963).


7. “‘Wife’ or ‘Wise’—*The Tempest* l.1786,” *Studies in Bibliography*, Vol. 31, 1978, pp. 203–8. See also *The Tempest*, Stephen Orgel, ed. (Oxford: Oxford University Press, 1987), Act 4, Sc1, l. 123–4 and note. The Oxford edition was the first to include the disputed reading “wife” in line 123. In preparing the selection of variant pages for the present project, Blayney reexamined the pages alleged to contain this variant in several copies and plans to publish his conclusions.


Peter S. Donaldson is head of the Literature Faculty and Director of the Shakespeare Electronic Archive at the Massachusetts Institute of Technology in Cambridge, Massachusetts.