Technical Communication and the World Wide Web

Edited by

Carol Lipson

Michael Day

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FOREWORD
Everything Seems to Be Up in the Air at This Time: The Ubiquity of Technical Communication

Johndan Johnson-Eilola
Clarkson University

Stuart A. Selber
Penn State University

Everything seems to be up in the air at this time
Everything seems to be up in the air at this time
One day soon, it'll all settle down
Everything seems to be up in the air at this time

—Camper van Beethoven, "Ambiguity Song"
(from *Telephone Free Landslide Victory*, IRS Records, 1981)

This next song, even though it is sad, we don't feel it has to make you sad. Sometimes I think just the opposite. Sometimes I think sad songs actually make me feel very good. . . . If it does make you feel sad, we'll try to remedy that as soon as we can.

—Wayne Coyne (The Flaming Lips), Introduction to "Superman" (from *Reverb*, a performance by the Flamingo Lips, HBO, November 9, 1999)

There is something both frightening and wonderful about being in technical communication as we make our way into a new millennium. The end of the 20th century witnessed an explosive growth in the field at almost every level, and this expansion has presented considerable challenges to those of us who are educators in college and university settings. *Technical Communication and the World Wide Web* productively addresses those challenges as they relate to the World Wide Web, a space that pushes and pulls on our disciplinary conventions, pedagogical approaches, and curricular designs, and—as the editors note in their introduction to this volume—promises to contribute in important ways to the ongoing debates over our disciplinary status and professional identity.

At least three distinct phases marked the development of technical communication (or technical writing) during the last century. First, the gradual professionalization of science and engineering disciplines brought with them a need for academic instruction in writing about technology, which contributed to the initial development of technical writing courses in academia for students who would write about technologies for some small (if significant) component of their jobs. Second, the increase in complex military technologies during World War II and the Cold War era—not the least of which was the rise of computer technologies—demanded specialists in technical writing and communication. Third, the relatively surprising growth of the computer industry during the last decade of the 20th century spawned the need for people who could communicate effectively about all things digital, and who could do so in globally networked environments that add layers of complexity to already complicated communication situations. Perhaps just as importantly, the degree to which computer use became integrated into a wide range of activities (e.g., work, home, school, entertainment, travel, etc.) meant that technical communication itself was becoming enmeshed within the fabric of our collective cultures. And then the bubble burst—sort of.

Everyone said that the Internet boom would finally bust, and eventually it did. In some ways, this bust provided important opportunities for technical communication. Almost without anyone noticing it—including ourselves—technical communication became a ubiquitous activity. To us, this situation signals a new era in the evolution of the field. In the same way that postmodernism draws on certain aspects of modernism, this era has evolved out of the three phases already mentioned. In other words, it is indebted to a history that continues to influence our practice and theory, for better or for worse. At the same time, the ubiquity of technical communication is a relatively new phenomenon, one that widens our work in ways before not imaginable. As many cultures have moved from industrial to information ages, they rely ever more heavily on the skills of technical communicators. Although one could easily make the case that cultures have been enmeshed in technology ever since the rise of fire or literacy or organized industry, rarely have people so clearly understood their lives and work and learning as intertwined with technology use. Technologies are no longer tools to users; they are environments, spaces, worlds, and conversations.

And, of course, the dot.com bust was not a total collapse. Whereas certainly sudden unemployment has caused much hardship, the collapse was not total. Instead, the bubble did not so much burst and collapse, as coalesce and fracture. Where there was once a terrain of apparently free and limitless movement, we now have something much more like a network (structurally speaking). And, across that network, in the multitude of fragments and strands, people are engaged in technical communication. In nearly every walk of life and every space, you can now find work that could be reasonably called "technical communication." To be sure, in many cases, people whose very success depends on technical communication do not even know that there is a discipline that calls itself by that name. But the opportunity is there. *Everything seems to be up in the air at this time.* Rather than a lament, the lyric sees opportunity.

Like many post-punk musical groups,[1] Camper van Beethoven (from whom this lyric comes) viewed the rapid rise and fall of punk music in the 1970s as the opening of a network of movement. Punk broke apart pop and disco genres, chewed up the fragments, then spit them back at a howling audience. The eventual collapse of punk seemed inevitable—one might think of self-destruction as punk's ethic. Ironically, as punk subsided, genres did not reform with the strength they previously held. Instead, post-punk acts—such as X, Camper van Beethoven, the Geraldine Fibbers, and others—enjoyed a new freedom to inhabit a multitude of previously unavailable musical spaces, criss-crossing at will. Camper van Beethoven careened from country and western to polka to waltz to punk to pop to folk without mocking any of the styles, a sort of engaged-but-flattened postmodern irony.

We see a similar movement going on in technical communication today. As a professional, academic discipline, technical communication dances at the productive edges of incoherence, moving out to other disciplines (e.g., information architecture, graphic design, literary theory, educational theory, legal studies, etc.), then dancing back with new techniques, abilities, and concerns. The chapters in this volume reflect that rich and active movement, engaging in a critical approach to technical communication that challenges itself in the ways that any responsible and concerned citizen challenges its own community.

More specifically, the editors have asked an accomplished group of scholar-teachers to consider some of the thorniest questions for educators in an age of ubiquitous technical communication. These questions, of course, contain many social layers (as the thorniest questions always do), and they involve traditional academic approaches even as they confound them. The authors succeed, in large part, because they refuse to turn to the all-too-easy answers, opting instead for reflective engagements that illuminate the most crucial technical communication issues associated with the World Wide Web. If you are looking for a quick Web-based activity for your next class period, then you should consult a different text. Although the authors provide useful practical advice, it is framed with patient discussion that must be digested slowly and deliberately. The payoff for readers is a coherent, articulated conversation, complete with interesting crosscurrents, and an opportunity to reconsider the integration of the World Wide Web into technical communication contexts.

A key context for this volume is curricula, and the authors invariably consider the ways in which our curricular approaches, as they have been traditionally

[1]We should point out here that the label "post-punk" implicitly fails to act as a cohesive genre. Other fans, players, and critics would likely include different groups and sensibilities.

mapped out, both address and fail to address the aspects of the World Wide Web that concern technical communicators. An issue with official courses of study is that they tend to resist change. This is not an altogether bad situation, because curricula should not be instantly or automatically restructured in response to fads and trends. On the other hand, the glacial pace at which curricula tend to change does not always encourage pedagogical activities and approaches that are sensitive to the realities of technical communication today. How does one write for an objected-oriented environment that functions more like a database than traditional text? How does communication work in globally networked spaces? What about persuasion? What types of rhetorical interventions are needed in the design of literacy technologies, including mobile wireless technologies? What are productive ethical and legal stances for the profession toward the creation and use of digital information? How does one participate both effectively and responsibly in distance education? Such questions ask us to take a hard look at the ways in which we are helping to develop students as professionals and citizens. If we look hard enough, we will undoubtedly find many success stories and good ideas. But, with the help of this volume, we will also see things that need to be reconsidered in an age of ubiquitous technical communication. We invite readers into an interesting and informative conversation about these reconsiderations, a conversation that bears directly and substantially on our collective future.

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Preface

From the start, this book has had strong support from the NCTE Committee on Technical and Scientific Communication, whose members began to see the changes that the World Wide Web was bringing to technical communication and who saw the need for a volume that would focus on the attendant curricular and pedagogical changes facing technical communication education. We wish to thank all the past and present members of the committee, particularly former chairs Rebecca Burnett and Bev Sauer and current chair Teresa Kynell Hunt, for their unwavering support of this book project.

We also thank our editor, Linda Bathgate, and our editorial assistants, Karin Bates and Kristen Depken, for their patience and guidance through the long process of review, revision, and manuscript assembly. The NIU English department provided generous research assistant support, allowing Huiling Ding to help with formatting the chapters and assembling ancillary materials. We are grateful for the department's support, and for Huiling's participation. Michael's colleagues, Christine Abbott and Phil Eubanks, offered wise suggestions on matters of technical communication curriculum and pedagogy; Eric Hoffman gave superb advice on technical issues, and Traci Gardner provided general online support to Michael in both technical and curricular matters. Carol thanks the College of Arts and Sciences at Syracuse University for its generous financial support, particularly for its provision of publication subvention funding to faculty in the humanities. Carol's faculty colleagues in the Writing Program have provided invaluable support for better understanding the implications of globalization and the wide range of cultural rhetorics on the teaching and practice of technical communication.

Additionally, we are grateful to Johndan Johnson-Eilola and Stuart Selber for agreeing to write a Foreword that is both playful and true to the spirit of this volume.

But we owe our greatest thanks to our 18 authors, who have much to teach us through their sound, forward-thinking contributions. We dedicate the book to the thousands of committed and devoted teachers of technical communication—whether full-time tenure-track faculty, nontenure-track faculty, part-time faculty, or graduate assistants—who daily struggle to offer the best preparation possible for their technical communication students, while the technological and cultural content for their students' writing has been undergoing such vast changes. This volume has been designed to provide for them both conceptual discussion of changes that authors see as called for in the curriculum, as well as practical help for an already overtaxed faculty to begin implementing such changes.

Introduction

Carol Lipson
Syracuse University

Michael Day
Northern Illinois University

The term *technical communication* covers a large purview, indicating very different things in different contexts. It is the title of a profession, in which writers make technical information available and understandable to nonspecialist audiences. But, it also refers to the kinds of writing that technical professionals, such as engineers and computer scientists, do as part of their jobs. The term itself is built on the older title of *technical writing*; the change acknowledges the fact that visual design became a crucial foundation for designing and publishing print texts, along with the fact that oral and graphic skills were seen as valuable for all workplace writers. More recently, for a range of reasons, the term *professional communication* has been used as an alternative to *technical communication.* In some cases, *professional communication* is used because it better fits the wide range of academic programs that require a technical writing service course for their students. Management students, public relations students, or education students may see themselves as *professionals*, but not as *technical.* Yet, these students frequently appear in required technical communication courses. In this context, the term has some limitations, because it is in fact not clear that an undergraduate getting a degree in biology, chemistry, or English is *in* a profession, as opposed to a field. The term *professional* applies rather loosely in such instances.

On the other hand, the term *professional communication* has been used to refer to writing done by writing specialists, and to degree programs that prepare students who will make a living as career writers (P. Sullivan & J. Porter, 1993). Carnegie Mellon's (CMU) English department, for instance, offers a BA in professional writing for students who wish to prepare for a career as writers in nontechnical specialties; CMU also offers a second degree, a BS in technical writing for those students who plan on careers writing about technical fields. Purdue University offers a single BA in professional writing, with two concentrations: one in technical writing, and a more general one in writing and publishing. Part of the attraction of the term *professional communication* is that it carries associations of the commitment of professions to ethical service for the common good (D. Sullivan, 1990). The term *professional communication* invites consideration of the obligations of professions that are not inherent in other available terminology: *technical communication, workplace communication, business communication,* and so on (Faber, 2002). For the degree programs that prepare individuals to become career communicators, the title places emphasis on the profession and on the professionalism of the communicator, rather than on the nature of the content of the communication. The shift in emphasis is an important one, bringing attention to the central identity of the position—one that communicators—and to the nature of the position as professional.

As indicated earlier, the new term, *professional communication,* seems to better fit in the case of degree programs than for the commonly offered service courses with heterogeneous mixes of students, although it is used in service courses in some cases (e.g., at Syracuse University). Such courses are often advanced writing courses that teach writing skills to broad audiences of students, many of whom will receive degrees that are not professional degrees. Because many of those degrees are not technical in nature, the common denominator in such courses often becomes writing for a workplace.

However, *technical communication* is still the more common term for the two types of programs: programs that offer service courses that bolster rhetorical and communication skills for students in a variety of fields, and programs that offer undergraduate and graduate degrees to those who will obtain positions as communicators. For educators in both service and degree programs, issues of curriculum have commanded much attention in the recent past, as developments in technology have placed pressure on the skills needed by future writers, whether or not career writers. The Modern Language Association (MLA) job lists of the last few years have announced positions for technical communications faculty with highly specialized technological backgrounds in areas such as multimedia, information architecture, graphic design, and database structures. However, departments have often been unable to fill such positions with qualified individuals, although these departments have deemed such hiring as beneficial or even vital for their students. As a result, continuing faculty can find themselves pressed to develop additional technical expertise when specialized new hires are not possible. But such continuing faculty rarely receive release time to learn the new technologies, are often not rewarded for doing so in departments that put primary value on scholarly publication, and often feel pushed to the limit.

We suggest that the new technological developments should not be viewed simply as burdens, but also as opportunities. As such, we suggest that technical communication educators examine carefully what openings these technological developments offer to enhance communication and information accessibility, to enhance ethical business practices, to enhance the possibility of global cooperation and global equity, to enhance opportunities for the technical communication profession to contribute to these goals, and to enhance the professional status of the technical communication profession. Above all, we should be examining how technical communication education can best take advantage of the current moment for greater impact on the business environment, and to enhance humanitarian and ethical goals. Faculty such as Cooper (1996), Johnson-Eilola (1996), Johnson (1998), Ornatowski (1992), Selber (1994, 1997a, 1997b), Sullivan and Porter (1993), and D. Sullivan (1990) have been primary voices in this direction, and we thoroughly endorse their approaches.

The impetus for this collection, then, evolves from the current historical context for the field of technical communication. We have all seen that the development of the World Wide Web has created conditions that change the nature of writing. Further, those involved in professional degree programs need to take into account the fact that instruction manuals and informational materials that in the past had been distributed in print form now more frequently appear in electronic form—on the Web, on CDs, and in videos. The Web has spawned conditions that call for new types of skills, particularly those that can help users locate, synthesize, and evaluate information. Skills involving the architecture of databases had not been part of the training of technical communicators, but they are now critical for making information available and manageable for users. In past years, some have argued that technical communicators needed to develop facility in a particular technological field (Little, 2000) in order to write; such facility may involve understanding of the subject matter, or knowledge of scripting languages, operating systems, and/or software packages. Others have argued that professional technical communicators needed to develop design skills in order to produce readable, usable print and online documents (Schnakenberg, 1999; Schriver, 1998). Still others argued that professional technical communicators should have some academic preparation to develop management and leadership skills (H. Smith, 1996), to learn to analyze and maneuver in corporate cultures (Lipson, 1986, 1987; Porter, 1996), and to learn how to facilitate change in an organization (Correll, 2002; Hotz, 2000). Savage (2000) argued that technical communication programs should include preparation for their students to take on responsibilities in corporate training. In each case, some voices were raised against such proposals, arguing that we were preparing writers, and that we should concentrate on honing their writing skills (see, e.g., Parsons, 1987). At times, such opposing voices explicitly cited the fact that technical communication faculty had no academic preparation for these wide-ranging areas.

Many of these issues come under discussion at annual meetings of the Council for Programs in Technical and Scientific Writing (CPTSC), because the purview of this organization involves curriculum in degree programs and service programs in the field. The proceedings for this meeting are posted online on the CPTSC website, and these offer a range of proposals for changes or additions to the curriculum. Frequently, these discussions are based on the challenges posed by the new technologies. For instance, Sammons (1996) argued that technical communication programs should offer courses in web page design, new delivery media, and other new technologies, citing specifically a range of software packages that employers seek experience with: RoboHelp, ForeHelp, Doc-to-Help, WinHelp, NT help development, FrameMaker, PageMaker, Interleaf, IconAuthor, AuthorWare, Visio, PhotoShop, CorelDRAW, and HiJack. And, D. Sullivan (1999) presented an extended list of technical knowledge necessary for web designers or managers, which also included DHTML, XML, use of programming languages such as JavaScript, CGI, and Perl, as well as familiarity with operating systems like UNIX. Sullivan argued not that industry demands such knowledge of technical communicators, but that a new area of expertise is opening up that technical writers can be educated to fill, and that may improve the status of the field.

At the 1996 CPTSC meeting, Johnson-Eilola questioned educational goals that make technical communicators subservient to industry's needs and determinations by simply teaching software packages for the needs of industry. He instead advocated that we educate students to develop a critical sense of communication, information, and knowledge within corporations, by looking to research in management theory, information management, interface design, and labor theory. Further, he argued that students need to acquire strategies for learning the fundamentals of new fields in order to contribute to new developments. That same year, Cooper (1996) described "strategies derived from postmodern theory that technical communicators need to learn in order to survive and thrive" in the changed conditions of the workplace, involving such elements as a world market, rapidly developing new communication technologies, and cultural diversity (see Salvo, chap. 3, this volume, for further discussion based on Cooper's proposals). Selfe (1995) argued that the technical communication curriculum must provide a broad-based intellectual background for future technical communicators, so that they can astutely analyze social issues surrounding new technologies, not just prepare to be expert users of new technology. Pass and Zerbe (1998) focused attention on the field's opportunity to provide education and training for technical translation, to fulfill the need in industry, governments, and nongovernmental organizations. They pointed to the lack of such training as more than a lost opportunity, claiming that by not answering such a demand, the field is doing a disservice to those organizations that hire technical communicators.

Now, more and more educators argue that technical communicators should learn some fundamentals of information architecture and database structuring, among other areas, in order to have the greatest impact on the quality of web communication (e.g., Johnson-Eilola, 2000). Johnson and Hart-Davidson argued for the value of user-centered design, and Hart-Davidson applied such design to the creation of large archives of information that become the source for the selection of smaller modules of customized information for particular users and needs (Hart-Davidson, 2001a, 2001b). Arguments of the sort summarized previously are also based in concerns that such background knowledge will allow technical communicators to better contribute to ethical developments in the use and growth of the Web, in order to help keep information freely available and readily usable. In addition, these arguments demonstrate a deep concern to advance the profession's status.

Even within the curriculum of degree programs, educators still have large questions about how to move beyond agreeing with these arguments to some sort of implementation. Some research indicates that what technical communicators need is basic familiarity with the capabilities and limits of different software and different perspectives, so they can work on teams with specialists who do the actual programming or who do the information architecture (4Cs presentations by Rehling, 2001, and by Schriver, 2001). Others claim that deeper mastery is needed. But now that the Web is being accessed on small handheld devices, many educators believe that a whole new set of design considerations must come into play, beyond print page design and computer monitor screen design, although design problems and other types of technological and financial difficulties have slowed the expansion of this opportunity for technical communicators (Perlin, 2003).

Additionally, some argue that the global audience for web materials creates a need for course preparation in issues of intercultural communication (e.g., Miles, 1997; E. Weiss, 1998; T. Weiss, 1992, 1993). Embedded in such arguments, at times, are proposals that technical communication curricula should teach students to write appropriately for translation into many languages for different cultures, as well as teach students to write suitably for comprehension by a broad international audience. The latter practices address audiences that might be anyone, anywhere—and as C. Smith (2000) pointed out, risk becoming no one, nowhere.

In fact, many businesses have been established to help corporations address this complicated audience of the Web. Some offer translation services to prepare versions of a website in a language of a particular target culture. They might offer internationalization services to render the website suitable for any English speakers internationally. Other groups offer services to advise clients concerning how best to globalize their websites. One group, called Web of Culture, now offers certification for companies deemed to have effectively globalized their sites. Further, organizations such as Xerox have developed training aids to help writers prepare documents for both machine and manual translation (Adams et al., 1999). An entire industry is developing that attempts to deal with the global issues inherent in the Web, yet technical communication education is only beginning to examine such issues rigorously.

The field needs to develop a keen sense of what kinds of skills are needed as a result of the new technologies, what communication issues arise in the new technical conditions, and to what extent technical communicators need to develop the technical expertise to contribute to the most beneficial uses of the new technologies. To do this, the field also needs to foster a strong critical sense of the inequities, dangers, and limits of the new technologies, so it can be positioned to advocate ways to address and avoid such problems. Current technological developments such as the World Wide Web offer the chance for technical communication faculty to assess how the curriculum can realistically and reasonably prepare students to have the greatest and most positive impact. In preparing this volume, we have invited contributors to participate in such a discussion, by proposing what changes they envision as necessary for technical communication education due to the development of the Web, and in providing concrete suggestions for an already stressed faculty to implement such curricular and pedagogical changes.

Some of the discussion of changes needed in the degree program curriculum is motivated by current demands on professional communicators. For instance, recent discussions on the Tech Rhet and ATTW listservs have suggested that technical communicators need to learn how to use Framemaker to produce and manage long documents, and Robohelp to produce online instructions and help systems, with associated glossaries, tables of contents, indexes. At recent STC conferences, presenters have argued for the value of learning XML for use in any dynamic online document that takes information from a database to reuse it or display it in multiple forms (Manning, 2002). On the other hand, some of the discussants of curricular reform are attempting to determine what changes may bring the greatest future impact for professional technical communicators, redefining the role of the technical communicator in ways that respond to conditions made available and visible by the Web. In such formulations, the role of the technical communicator often moves from writer to database specialist (Johnson-Eilola, 2000), to instructional design and training specialist (Hotz, 2000; H. Smith, 1996), to user/advocate in product or database design (Johnson, 1998), to production manager for documentation (Allen, 1994; Price, 1998), to manager of collaborative organizational writing (Peeples, 1996), to information architect, to information designer, and so on. In any case, the move is often away from what many of us consider writing, although some arguments are made for the need to attend carefully to writing (Bernhardt, 2000; Coney & Ramey, 1999).

The technical communication service course faces quite different pressures. Often, disciplines across the campus require their students to take such courses in order to improve skills in written communication. At times, such a requirement is mandated by accreditation pressures that direct attention to industry's dissatisfaction with the written performance of graduates. Such service courses are often heterogeneous in nature, with students from engineering, computer science, information technology, nutrition, English, political science, and so forth. These courses are judged by faculty members in the various disciplines according to how well they improve students' writing skills. The focus tends to be on workplace genres. In some schools, such courses may serve as introductory requirements for students who are planning on becoming technical communicators. These students would then appear in the same sections, as do the students from other fields. Such is often the case in schools that do not have large enough numbers of potential professional technical communicators to warrant separate introductory courses.

Technical developments have decidedly had an impact on such courses, which often include web writing, PowerPoint presentations, and principles of visual design. Indeed, much of the pressure to reform curriculum in these courses comes from the saturation of the technology in the workplace, as a medium for communication and for work in general. Those researching the skills needed for the future workplace cite the importance of knowing how to learn to use new technologies as a crucial skill for success, independent of discipline or profession (Boyett & Boyett, 1996; Boyett & Conn, 1992). These same researchers cite problem-solving skills, collaborative skills, communicating skills (including listening, speaking, and writing), and lifelong learning skills as having high priority for workplace success. Thus, whether or not students in a particular discipline or workplace will be required to develop websites, one can defend such website-development activities in a technical communication class on the basis of more general skills that are ubiquitously needed. Such courses may help students develop online web portfolios, whether for purposes of curriculum assessment, student job-market preparation, reflective learning, or as a means to help students develop a range of rhetorical skills. In this way, the electronic portfolio becomes a teachable moment—an assignment that students tend to find engaging and relevant. Although many do include web writing, with few exceptions, the technical communication service courses necessarily are expected to focus on more traditional writing skills.

Thus, the service curriculum and the degree curriculum often diverge greatly. The service courses are the most difficult to change rapidly to accommodate new technology, partly because such courses are often taught by graduate students and part-time faculty, and by faculty in disciplines other than technical communication itself, whose acquisition of new technological skills may be constrained by time pressures. Even the full-time faculty technical communication specialists face enormous time pressures to keep up with the new technologies and the various new areas being recommended for inclusion in degree programs, because they usually face the same publication pressures as do literature and composition colleagues. In some academic fields, faculty might be given course relief in order to learn major new areas that are needed in a curriculum. However, in most English departments or writing programs, where large numbers of technical communication faculty are housed, such an opportunity is not available. Undertaking the teaching of a new skill or area is often the main way for such faculty to learn the skill, through inquiry and exploration with one's students. However, students from other disciplines such as engineering, computer science, information studies, and management come to their courses with expectations that the faculty members are experts and will pass on their expert knowledge. Technical communication service courses that involve students in problem solving and in "learning to learn" new technologies or skills can face resistance from, and be panned by, students for whom such teaching is anomalous. Faculty at all levels can be highly vulnerable to this negative reception by students. In addition, such inquiry-based teaching may not fit the teaching styles of many technical communication faculty members. In the end, several factors (e.g., the lack of teacher preparation, lack of equipment, and student resistance) restrict faculty from including new technologies in technical communication service courses. Of course, some factors are substantive and fundamental, based on the needs of the academic units that send students to the service courses.

Attention to the global nature of web communication has also not had a major impact on the curriculum in many technical communication service courses. Some textbooks and collections of case studies are now available, and some articles have appeared in technical communication journals. Yet, more discussion is needed to help teachers of service courses determine that this area should be covered in their courses, and to help them develop a concrete sense of how they might do so substantively, how they can avoid the pitfalls, and what are the critical issues involved.

The journals and edited collections in technical communication do make clear that global realities form a major factor in the work of technical communication practitioners (see, e.g., the special issue of *Technical Communication*, May 1999, entitled Global Issues, Local Concerns; also Potsus & Kvaavik, 2001). Websites and print instruction manuals or guidebooks need to be understandable by their readers, and often need to be available in languages other than English. We know from experience and reports that many current technical communication practitioners must frequently attend to issues of intercultural communication that include writing and designing suitably for proper understanding by those for whom English is a second language, or writing and designing suitably for translation into other languages. Presentations at STC conferences, and abstracts in *Technical Communication Online*, also make clear that the process of managing texts requiring translation demands careful consideration and knowledge. Few degree programs have introduced specialized courses that give particular attention to these areas, however.[1] And very little analysis from a critical perspective examines the cultural and global issues involved in technical communication. This is true both for global issues and for local cultures within North America. Such analysis and engagement are needed; thus, we include chapters on web-based intercultural communication issues in this volume.

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[1]Exceptions include the University of Memphis (Maylath, 1996) and James Madison University (Pass & Zerbe, 1998).

In his 2002 keynote address at the CPTSC, an organization with representation from major degree and service programs and with a particular concern for curriculum, Huckin pointed to a "glaring lacuna" in the teaching of technical communication. He identified the gap as "the lack of attention to broader sociopolitical issues. . . . Technology is not an autonomous force but invariably has sociopolitical underpinnings and sociopolitical consequences." Although Huckin acknowledged the introduction of service learning in many technical communication courses to address these concerns, he also pointed out that service learning offers a microcontext, while the larger macroissues remain untouched. Huckin cited the need for technical communication to attend to the effects of the corporatization and ideology of free markets. In his view, the students in our technical communication courses will be participating in a global context, participating in globalization, and "should be made aware in our courses of the issues raised by globalization both at home and abroad." Technical communications have an important part in globalization, and because context analysis is crucial to good communication, he suggested that the groundwork is available for technical courses to address the "larger sociopolitical factors" within that context. Yet, as Huckin pointed out, few articles appear in the technical communication journals and little discussion is available in textbooks of this nature, although the related fields of applied linguistics and ESL/ESP have been actively taking up such issues. Huckin proposed critical discourse analysis as a pedagogical methodology for use in such teaching. Although Huckin's examination may have been based in discussion of degree program curriculum, his points do seem applicable to the service courses as well.

Selber (2000) proposed the benefits of a web support system for the technical communication teaching community to aid overworked faculty. The Association of Teachers of Technical Writing offers on its website a range of links to syllabi, and the possibility for faculty to submit syllabi for inclusion. Bibliographies and teaching suggestions are included as well. One area of this site does include lists of resources on teaching international communication. However, many of the issues that we have identified as crucial for the technical communication curriculum are not yet supported by submissions on the ATTW site. The ATTW listserv facilitates the submission of questions and responses, but little has appeared on globalization, on sociopolitical issues, or on translation issues. This volume will help to fill the gap, hopefully spurring new submissions to the growing web resource and new discussion on the listserv.

A HISTORICAL VIEW: THE WEB AND EARLY TECHNICAL COMMUNICATION SCHOLARSHIP ON CURRICULUM

Using a protocol invented by Berners-Lee and others in late 1989, the World Wide Web captured the imagination of the Internet world in 1993 with the release of the Mosaic web browser. When entrepreneurs, advertisers, and corporations realized the possibilities for this new medium, which allowed seamless transmission of graphics, formatted text, and sound over the Internet, they quickly changed the landscape of the "information highway" from one dominated by academic, hobby, and social groups to one increasingly focused on commerce. The U.S. government also had a hand in this transformation, when in 1994 the National Science Foundation, which had previously maintained some control over the Internet, began to allow commercial interests to take control and charge fees. From 1993 to 1997 alone, the percentage of commercial (.com) sites rose from 1.5 to 62 (Gray, 1996). As of 2002, the World Wide Web was home to about nine million websites, of which about 16% were designated as "e-commerce" sites. However, Netfactual.com estimated the number of discrete web domains at 29,047,142 in April 2003, indicating that 78% of those sites were .com sites. Trends show that despite a slowdown with the economic downturn of the early 2000s, commerce on the Internet, both for home consumers and for business-to-business transactions, will continue to expand in coming years.

Similarly, the Internet itself has seen a population explosion since the inception of the World Wide Web. In 1993, there were about two million Internet users worldwide (Malone, 2002), a number that Nielson/Netratings calculates surged in 2002 to 580 million, and that number is projected to surge to 709 million by the year 2004. Of those 580 million users, 166 million were in the United States, indicating that the other 414 million users live in other countries and cultures. With record numbers of businesses and institutions recognizing that they can reach clients through the Web, and record numbers of potential clients connecting to the Internet, the Web has eclipsed many other media forms for disseminating information, such as print. Although print documents still have a place in the flow of information among individuals and institutions, those who wish to pursue or upgrade a career in writing, designing, and shaping that information will need to prepare by learning how to create online documents for the Web. But how did technical communication faculty publications respond to these new developments? What were the early major voices and positions regarding the types of changes called for in technical communication curricula?

As early as 1989, Tebeaux set the bar for educators in "The High-Tech Workplace: Implications for Technical Communication Instruction." Here Tebeaux predicted that information technologies will "produce worldwide communication systems" (p. 140), resulting in the need not only for technical communicators to retool, but also for them to "know how to communicate with employees of different cultures and understand the culturally accepted prerequisites of communicating and working effectively with employees in other cultures" (p. 140). Specifically, Tebeaux suggested that the proliferation of information in a variety of computer-based and online forms will require technical communication programs to focus more on "the study of audience (as users of information), of the purposes for which information may be used, and of the contexts in which information may be processed and then applied" (p. 142). She pointed out that students would need to "understand how to generate reports from data, that is, how to extract information from quantities of raw data, analyze it, and sift, shape and summarize it to enable readers to make efficient, accurate decisions" (p. 142). More than 15 years later, her predictions appear prescient.

Further, in the context of suggesting new approaches to teaching technical communication research, Tebeaux recommended that educators go beyond cursory attention to abstracts and indexes, to "emphasize how current search systems are devised and organized, the kinds of systems available, theories of indexing, the changes that standard research systems (like card catalogs and major indexes) are undergoing, and procedures for developing search strategies to access online material" (p. 143). However, as much as she advocated the incorporation of information technology into technical communication education, Tebeaux still warned readers that any technical communication curriculum must pay close attention to "the proper relationship between computer literacy and human analysis and perception" (p. 143)—that is, the ways in which humans, not computer programs, make meaning.

The extent to which Tebeaux's predictions predated developments in the field can be seen in one of the major volumes on technical communication pedagogy—the first volume in the ATTW series on Contemporary Studies in Technical Communication, edited by Staples and Ornatowski, entitled *Foundations for Teaching Technical Communication: Theory, Practice, and Program Design* (1997). Published 8 years after Tebeaux's article, this volume mentioned the World Wide Web only a few times: as a vehicle for Internet collaboration in the chapter by Burnett, White, and Duin (1997, p. 143), and in the context of Wahlstrom's (1997) recommendations for how research in rhetorical design strategies should be included in technical communications programs (p. 310). Shirk (1997a) made no mention of the World Wide Web, except by implication as one of the information spaces, enabled by the information technology revolution, for which technical communicators would need to write and design. Selber (1997b) offered the most relevant recommendations for incorporating web design into technical communication classes. Although he did not use the term "World Wide Web," he did refer to "on-line media projects" (p. 194) and discussed and differentiated between hypertext and multimedia. Selber was one of the most forward-thinking technical communication scholars writing in 1997 in his recognition that the technical communication curriculum must be reformed to include much more attention to visual design, hypertext, and multimedia, and in this reformed curriculum, teachers would "need to continually examine notions of rhetoric and how they illuminate and fail to illuminate the design of multimedia and hypertext as discursive spaces" (p. 206). The chapters in this volume by Honeycutt and McGrane (chap. 4), by Hart-Davidson (chap. 1), and by Rice and Papper (chap. 14) all directly carry out such examinations of web texts, and the limits of standard rhetorical theory and terminology in dealing with such phenomena. Several authors argue for the need to draw on other disciplines and new theoretical formulations.

Selber's *Computers and Technical Communication: Pedagogical and Programmatic Perspectives* (1997a) more directly approached such questions, asking educators to abandon outmoded notions of computers, computer literacy, and computer-mediated communication. In his own chapter, Selber showed how technical determinism from pedagogical, institutional, and industrial forces has limited our thinking about the social and instructional possibilities of hypertextual works in technical communication and academic settings (pp. 17–43). In the same collection, Porter considered legal and ethical factors affecting the production of online (or electronic) text (pp. 45–73); Porter extended his thinking on this issue, with specific attention to the World Wide Web, in the current collection. Brasseuer's chapter in Selber's book suggested that the new graphical possibilities of computer-based information and communication demand that educators in technical communication teach students to think visually (p. 79). In describing "New Roles for Technical Communicators in the Computer Age" (p. 353), Shirk (1997b) noted that many technical communicators will need to become information architects (p. 362), a claim that some authors in the current collection use as a starting point for their chapters on pedagogical and theoretical applications of information architecture in the technical communication curriculum.

Further chapters by Duin and Archee, Burnett and Clark, Allen and Wickliff, and Mehlenbacher discussed the design of collaborative online environments for technical communication classes, with specific attention to the change in rhetorical dynamics brought about by the migration of so much communication and collaboration to webbed environments. Duin and Archee more directly addressed the problems of web page design and pedagogy, discussing "three theories to guide the development and use of Web home pages for use in distance learning: cognitive flexibility theory, dramaturgical theory, and social theory" (p. 156). Rather than relying on the more familiar terms of rhetoric and design, these three theories draw on disparate disciplinary approaches—cognitive studies, drama, and sociology—to forge conceptual schema that allow technical communicators to develop new approaches to web design and analysis.

In 1997 also, Krull of Rensselaer Polytechnic Institute hosted a conference entitled, "The Five-Year Horizon: Skills and Education for the Information Technologist." In their words, a major focus of the conference was "to discuss the changing role of information technologists, particularly technical communicators" (Krull & Grice, 1997, p. 1). The conference came to general agreement not only that technical communicators would have to update their skills to meet the demands of information's expansion into the web online environment, but also that schools and universities had thus far not risen to the challenge to help technical communicators update their skills. Krull and Grice wrote that a representative from Anderson Consulting pointed to the "tremendous opportunities for education institutions to fill the gap between industry needs and industry training capacity, [though] educational institutions were insufficiently attentive to the opportunity. This showed up, he said, in universities' failure to deliver relevant course material and inability to adapt to industry changes, scheduling, and course delivery needs" (p. 9). Four years later, in their introduction to the landmark issue of *Technical Communication, 2001, A Professional Odyssey*, Krull and Grice reiterated and built on claims from the 1997 conference that technical communicators would need to upgrade their skills in relation to information technology.

Clearly, 1997 was a watershed year in the increased and explicit recognition that changes would be required in the technical communications curriculum, in light of technological developments. In view of such calls for change in technical communication education, in the past 5 years courses in technical communication have indeed begun to offer more focus on web writing and design, but such attention is still limited in many curricula. Less emphasis is being given to information architecture or database structuring, and even less to rhetorical and cultural issues raised by the global nature of the Web, or to copyright and legal issues relating to the international nature of the web environment.

It is our hope that this volume can encourage the necessary rethinking and discussion of the technical communication curriculum, and can supply both theoretical positions and concrete suggestions for technical communication faculty to consider and apply. We did not receive submissions on all of the issues we raise here. In these areas, this volume hopes to bring needed attention to some critical gaps. For instance, no submissions deal with the issues of translation, which deserve careful attention in the field. Often, an informational document is created for an everyman audience based on rhetorical understandings of a particular cultural framework, and is written in simple English language for translation into other languages. Whether such a process can yield texts that fit rhetorically with the practices of other very different cultures seems to be an important question. Does putting the English words into words of another language necessarily make the document rhetorically effective and suitable for the communication practices of different cultures? What is the effect of such a process? We would hope to see future substantive attention to such questions.

THE FOCUS OF TECH WEB

The major areas of focus in this volume are threefold:

1. What are the curricular changes called for by the information architecture anddatabase requirements of the Web?
2. What are the changes to technical communication education called for by the complex legal copyright situation raised by the Web?
3. What are the curricular changes arising from and taking advantage of the global nature of the Web?

The chapters included in this collection address these questions, specifically suggesting curricular changes or pedagogical applications for all levels of technical communication education, from the community college level to the graduate level, from service courses to degree programs. The chapters are divided into two main sections: One addresses general needs for change in the curriculum, and the second concentrates on specific suggestions for technical communication pedagogy.

Part I, curricular implications, begins with a set of chapters addressing whether, how, and why attention to information design and information architecture should be addressed in the technical curriculum. In chapters 1 and 2, the authors both argue that in degree programs, the curriculum needs to include attention to object-oriented programming. In chapter 1, Hart-Davidson argues that the interactive nature of the Web will bring an increased expectation for and ability to deliver customized, dynamic content, to meet the differing needs of users. With the availability of new technologies, especially XML (Extensible Markup Language) and CSS (Cascading Style Sheets), Hart-Davidson predicts that single-sourcing will become more common as a way to deliver documents suited for specific uses. Single-sourcing involves the use of a single, central database for content, from which customized information can be delivered for particular users and needs. In such a system, units of content are reused in different formats and genres. Thus far, Hart-Davidson argues, technical communication curricula have mainly not taught such publishing approaches. Hart-Davidson's chapter can help technical communication faculty understand the concepts of such object-oriented text creation, through his discussion of a specific complex website that offers information on how to electronically file taxes. Hart-Davidson shows how the design of such a website in an object-oriented model could allow users to more readily gain access to the information they need. Because such a shift in customizing information involves rhetorical tasks spanning all five canons of rhetoric, Hart-Davidson begins the valuable work of developing a rhetoric that technical communicators can work with in teaching and analyzing the new object-oriented real of content creation.

Pullman, in chapter 2, similarly argues that technical communication degree programs need to adopt an object-oriented pedagogy. Pullman points out that documentation, one of the major tasks of technical communicators, is now increasingly dynamic, ever changing, involving not only the voices of the software creators but also of users. According to Pullman, technical communication faculty need to learn server-side scripting, and need to teach about writing for constantly changing content, supplied by different people and even by machines. He suggests that a practical way to prepare future technical communicators for this situation would be to teach XML (Extensible Markup Language). The chapter offers examples, including XML code, ideas for assignments, and a sample course outline. The course does not intend to teach specific software or even database design, but instead aims to teach students how to teach themselves the needed software in order to solve rhetorical problems they face. For faculty just beginning to take on the new area of object-oriented pedagogy, the suggestions and materials offered by Pullman can be invaluable.

The next two chapters in part I address the value of bringing information architecture into the technical communication curriculum. Salvo, in chapter 3, looks at the growing field of information architecture and the opportunities it brings to professional technical communicators. According to Salvo, this new field constitutes a new genre of documentation, representing information space as the nexus of user, content, and context. Salvo argues that information architecture represents a postmodern form of technical communication—one that can help students of technical communication understand and shape future technology while also expanding their functionality as technical communicators. He contends that degree programs in technical communication should teach information architecture, thereby offering an attractive way to prepare students for writing in today's postmodern culture and workplace conditions. Further, he argues that technical communicators, bringing their rhetorical expertise, can help enrich and extend information architecture as currently practiced. By describing a course he taught at the graduate level, Salvo offers concrete ideas for technical communication faculty to bringing information architecture into their teaching.

In chapter 4, Honeycutt and McGrane assess and demonstrate the different advantages of two approaches to teaching website design: a rhetorical approach and an information architecture approach. Responding to the criticism of Moore that the rhetorical approach offered in most technical communication courses does not meet the needs of technical communicators' workplace writing, Honeycutt and McGrane argue that the two design philosophies—rhetoric and information architecture—should both be taught in technical communication degree programs, and that both offer invaluable perspectives. Applying a detailed analysis of two large websites, the authors illustrate the areas of compatibility between the two philosophies and terminologies, but also the distinct contributions of each approach. This discussion can be particularly helpful for graduates of degree programs who will have to translate their rhetorical concepts to industry colleagues with very different backgrounds. Similarly, the discussion is helpful for technical communication faculty schooled in rhetorical concepts, to help them make the translation and transition, and to help them fill in the gaps that standard rhetorical approaches do not address. As does Hart-Davidson, Honeycutt and McGrane begin a process of repurposing rhetorical concepts for the new web writing contexts. Their discussion points to the need to reinvigorate discussion of two canons of rhetoric—memory and delivery—to address the limitations of a purely persuasive view of rhetoric, which cannot account for many aspects of website design. They suggest the need to view rhetoric not purely as a heuristic for persuasive discussion, but as a heuristic for deliberation, with ethical decision making as the goal. Their pedagogical suggestions point also to the need for students to work collaboratively in online distributed environments, as is common in industry. Because such a process requires familiarity with approaches to manage control of pages, versions, and drafts, they suggest that degree programs introduce students to software that involves file-sharing protocols to help manage such asynchronous web drafting. Whereas they argue that it is too early to teach XML (Extensible Markup Language) in basic web classes in technical communication programs, they do see the shift to XML as inevitable and transformative for technical communication curricula in future.

Chapter 5, by Barber, picks up some themes raised by the two chapters on object-oriented pedagogy. Barber speculates about the future directions of the Web—specifically the wireless Web—and the skills that technical communicators will need to develop content for such communication modes. Wireless webs, he predicts, will enable mechanical collection and transmission of data, without human intervention. Smart environments will create new ways of doing business and of doing chores in the home. Although web pages are now written for human readers, computers might well in the future often be communicating to other computers, changing the needs of such writing. According to Barber, our curricula will need to help technical communicators learn to adapt information for delivery to a variety of wireless devices, with different interfaces and constraints. Because the wireless Web will allow for more personalization in the information collection—more customization and filtering—technical communicators will need to learn to adapt and repurpose content across platforms for such a multiplicity of targeted audiences and users. With the variety of different devices being used, technical communicators will need to learn to design for usable display of content under a realistic range of lighting conditions, time constraints, input methods, and user interfaces. Furthermore, Barber predicts that the worldwide nature of such a wireless Web will require technical communicators to deal with the differing technology standards in different countries. Given these conditions, Barber suggests that technical communicators may need to learn computer and scripting languages as well as a variety of wireless scripting languages. His analysis suggests that technical communicators should also be given backgrounds in visual design and art history, video and audio production, as well as technologies that enable their incorporation with text.

The second group of chapters in part I speak to ways that educators can incorporate attention to the range of cross-cultural issues that arise in communication within the global context. Two chapters (by Herrington and Harootunian) are based in experience of cross-cultural teaching in Eastern Europe, and the third offers a wealth of suggestions for faculty to use in introducing this area in their courses. In this chapter, which appears as chapter 6, St. Amant examines the complexities of writing for international online audiences, applying the lens of the rhetorical concept of ethos. With only 50% of international Internet users coming from the United States or Canada, technical communication is affected in multiple ways according to St. Amant, including the fact that workplace communication will address a diverse set of audiences with different cultural expectations.

Technical documents may increasingly be created by and for international groups from different countries, with different cultural expectations. St. Amant argues that writers must then develop understanding of a range of different cultural aspects related to credibility, and to other problem areas involved in online communication with individuals from other cultures. St. Amant offers helpful strategies for writers to navigate such complex situations, and a rich array of exercises to help students develop their understanding and abilities. He also suggests a range of online resources that can help writers as they create materials for online global audiences.

Herrington, in chapter 7, describes a course she teaches in collaboration with a professor from Russia. Entitled the *Global Classroom Project*, this course uses the Web as delivery medium to present a course in which students from Russia and the United States—specifically from the Russian Academy of Sciences and the European University of St. Petersburg, and the Georgia Institute of Technology—study technical communication together. In this course, the students develop analytical texts that address global communication issues. Using a framework developed by Kemp for analyzing pedagogy, the chapter discusses the choices made in designing and enacting the curriculum for this complex intercultural situation, and the rationale for such choices. The experiential dimension of this course setting helps students to develop their understanding of how to handle both collaborative processes and communications across cultures.

Chapter 8, by Harootunian, addresses issues affecting writing in the former Soviet republics, as well as issues affecting cross-cultural teaching in these countries. Based on her experience teaching in Armenia, Harootunian argues that cognitive patterns have become ingrained by the cultural contexts in these countries—particularly the educational, political, and economic systems. Any writing done for these cultures must recognize the perceptual differences, and any teaching by Western specialists for students from these cultures must take these differences into account. Yet, Harootunian points out that because the Web is based on a democratic writing culture—one foreign to the experience of the newly independent states—teaching global media like the Web, and teaching professional genres common in technical communication courses, offers an opportunity to help students in these countries extend their awareness of democratic systems. The chapter offers a model of a course for American students that can raise their awareness and experience in addressing international writing issues related to the Web.

The chapters in the third section of part I focus on the need to incorporate legal and ethical issues in the technical communication curriculum, in order to prepare technical communicators for the problems they will face. These authors address the effects of the World Wide Web in the work of technical communicators, looking to what technical communication faculty will need to know about the changing context for technical communication in order to prepare their students for current and future practices. The chapters by Gurak and Logie offer ideas for pedagogical use. The third, by Porter, offers an impassioned rationale for bringing attention to these legal questions into our courses for future technical communication professionals.

In chapter 9, Gurak examines a variety of types of ethical issues that arise for technical communicators in their work in the digital environment. She points to specific privacy issues that technical communicators face in the type of work they do, whether in developing documentation or consumer materials for new technologies. Similarly, she raises questions about the influence of U.S. domination, with the attendant individualist values, on technology and documentation development for other cultures. E-mail, whistle-blowing, plagiarism, and research are all raised as areas for attention to ethical issues facing technical communicators. In all of these areas, Gurak advocates that faculty use actual case studies with students, and place students in service-learning-type work settings where such issues will arise. The chapter raises the types of questions that can arise in each category under examination, offering guidance for a faculty member new to this area.

Logie, in chapter 10, provides a brief review of the history of intellectual property policy to help ground understanding of the national and international issues, as well as understanding of their cultural contexts that affect the practice of technical communication. This history suggests that in the future, fonts, images, and interface design will be objects of contention for use by technical communicators in both documents and websites. Thus, Logie's historical overview can help faculty better prepare students for current and future work situations, but can also aid faculty and future technical communicators in developing the understanding to critique and perhaps help change the copyright policies. As Logie points out, technical communicators are often in the front line in using new communication technologies, and as such, are the most knowledgeable about the ethical issues that arise. Although in the past they have not raised voices on such issues as a group, Logie makes a strong case for the profession and for educators to become actively involved. The chapter offers suggestions for ways that faculty can begin to introduce students to such issues, and for ways that professional technical communicators can begin to raise attention to the problems.

The last chapter in this section, chapter 11 by Porter, addresses the points of tension that technical communicators face when legal restrictions come into conflict with the technical communicators' obligations to the audience and to the public more generally. The chapter specifically examines some of the ways that these conflicts can occur, focusing particularly on effects from reactions to the 9/11 terrorist attacks, and on effects of challenges to the Fair Use Act involving digital information. Porter makes specific suggestions to the technical communication field, urging changes to the professional code of ethics by noting ways that it does not appropriately address the current situation. He argues that faculty need to teach students to critically examine digital laws and policies, and that faculty train students to see their responsibility (once they become professional technical communicators) as advocates for the public good and not just as obligated to employers and clients.

Part II offers concrete suggestions on specific courses, assignments, and practices that faculty can use as models, with one exception. That exception involves the chapter by Rice and Papper (chap. 14), who argue for the need to engage our students in holistic experience of developing multimodal texts, involving video, graphics, sound, and text.

In chapter 12, Carliner argues for a curriculum that trains technical communication students in the entire publication process as implemented in industry; such a curriculum would need to integrate attention to process management, visual communication, designer for users, production, and usability. Carliner offers a historical examination of the development of such publication processes. Although acknowledging the impossibility of any single course fulfilling all the needed functions, he describes two ways that technical communication faculty can bring the process into the classroom: through service learning or broader experiential projects, or through the use of upfront planning tools of varying complexity for different level courses. The chapter proposes a way that the process-oriented approach can allow a technical communication project to structure the curriculum into a whole, with different courses giving emphasis to different stages of the process, enacting the process at different stages or with different degrees of complexity. Carliner further proposes ways that this organizing principle can suggest different goals for undergraduate and graduate degree programs—with a graduate degree giving more attention to the management of the process, and the undergraduate emphasizing mastery of the process itself.

Chapter 13, by Loudermilk, argues that the new writing contexts of the World Wide Web require that we help our students function in both the world of hardcopy texts and online texts. Loudermilk applies a term borrowed from Vitanza, *paraRhetoric,* which calls for a different approach to textuality and to textual space. In applying the term paraRhetoric, Loudermilk seeks to help students understand the Web as a changing object, a different cultural space. To aid technical communication students in becoming efficient communicators in this environment, Loudermilk describes ways to utilize the Web as the contextual community in our technical communication classrooms. She describes a variety of activities that can help students understand the existing technical structures and look toward the future. In such a reconfiguration of teaching technical communication students, the faculty member becomes a coach and fellow meaning maker, helping students develop ways to understand how to function within changing contexts.

Chapter 14, by Rice and Papper, presents an argument for teaching technical communication students the use of multiple media for web communication, proposing ways that the medium and message both constitute message. The chapter indicates the need to help students understand how communication and technology work together. The authors advocate the use of the term *composing* rather than *writing,* because composing addresses characteristics of visual, oral, and presentational modes of communication; they also advocate that faculty present assignments that embrace the multiple media. Rice and Papper argue that each medium shapes our rhetoric by affecting how we communicate. Each medium, they point out, involves a special literacy, and technical communication faculty need to prepare students for these literacies.

In chapter 15, Lang advocates the benefits of introducing a collaborative website redesign project within a technical communication service course, particularly in the ways that such an assignment forces experiential learning of the process of generating large documentation. Lang describes the project in some detail, along with the various written documents that support the work at different stages. The chapter presents a range of benefits from this project: the attainment of a critical understanding of the web medium and of a greater understanding of document generation within the course; experience of the document generation cycle and of the management of large projects; and focus on the visual aspects of technical communication, including both competency and analytical abilities. Lang points to an additional advantage of the project, in changing the role of teacher into facilitator for groups, managing the overall process, while the student groups learn by doing.

Chapter 16, by O'Sullivan, brings in the perspective of the 2-year college. She describes a new course developed as part of a certificate and a 2-year degree in technical communication. O'Sullivan points out that technical communication at the community college level is not discussed much in the journals, herself providing a welcome overview. The chapter offers a rationale for creating an online course within a 2-year technical communication program, and a rationale for the design of its website. O'Sullivan describes the course projects, offering a justification for each, given the students who are served by such a degree program.

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I

IMPLICATIONS FOR CURRICULUM IN DEGREE AND SERVICE PROGRAMS

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1

Shaping Texts That Transform: Toward a Rhetoric of Objects, Relationships, and Views

Bill Hart-Davidson
Michigan State University

More and more often, the texts we see on the Web double as interfaces with which we can interact. By clicking links, by specifying preferences stored in a cookie, or even by simply visiting a page at different times during the day, we can expect—if not explicitly cause—texts on the Web to change. Often we are able to change them so that they better serve our needs. And, occasionally, we can personalize them to such a degree as to ensure that they will work better for us in future situations. In fact, users have come to expect content on the Web to be dynamic and customized, hence the terms to describe content that is not ("stale," "canned") or whole sites that do not change ("brochureware").

The feature that enables dynamic content is one of the most exciting, yet under-heralded, qualities of the World Wide Web: its ability to serve as an object-oriented, distributed publishing environment. Technical communicators have become involved in the development of websites on a routine basis, often translating or repurposing hard-copy documents for delivery on the Web. As documents move to the Web, there has been a corresponding rise in technical communication's attention to some of the pivotal issues in Web design, including integration of visual and verbal information and information architecture/navigation. The next step, some argue, is to bring more value to these online formats by making them more responsive to users' needs (Van der Geest & Spyridakis, 2000).

As technologies and standards such as Cascading Style Sheets (CSS) and eXstensible Markup Language (XML) have surfaced to make the Web more amenable to distributed publishing, the field of technical communication has turned its attention to object-oriented models of content delivery, especially "single-sourcing," or the practice of creating a central repository of information from which several target formats, genres, and display conditions may be generated (Albers, 2002; Rockley, Kostur, & Manning, 2002). Single-sourcing as a concept, however, is not new. Standard General Markup Language (SGML), an older publishing standard developed for the express purpose of single-sourcing and cross-format delivery, is the parent of XML, in fact. And, not surprisingly, single-sourcing is not widely used outside of large firms that can benefit from the process efficiencies of generating multiple formats by reusing blocks of content. So whereas single-sourcing is on the rise as the Web's capability to support object-oriented distributed publishing grows, technical communication curricula have for the most part left the teaching of single-sourcing largely to those who deploy the technique. This means that a few important and more fundamental concepts that drive single-sourcing are also missing from technical communication courses.

This chapter argues that, apart from single-sourcing, there is another way technical communicators can begin to see the benefits of object-oriented distributed publishing on the Web, and it has everything to do with an important goal all writers share: optimizing the value of a document for its audience. Technical communicators can now create documents that are able to *transform* to meet the needs of their users. Some of the concepts and techniques we employ to do this are familiar, even ancient, strategies for multiple audience adaptation. Other valuable concepts, however, come to us from the field of human–computer interaction, specifically related to the design of object-oriented user interfaces. One of the most important of these concepts involves defining information *objects* that represent the key resources with which a user interacts. Further defining the *relationships* that exist among objects enables the designer of a user interface or dynamic document to specify specific conditions for displaying objects in order to support user needs. These displays, or *views*, frame the user experience and, as a result, greatly affect the value of a given document.

This chapter explains how technical communicators can use the basic concepts that enable object-oriented modeling of user interfaces—objects, object relationships, and views—in conjunction with rhetorical strategies for audience adaptation to shape texts that transform.

FIVE QUALITIES OF VALUABLE WEB CONTENT

The motivation for shaping texts that transform is related to five basic qualities of valuable information, which is often referred to as "content" in the era of the World Wide Web. Technical communicators must understand and exploit these five qualities in order to maximize their value to the organizations in which they work. Indeed, technical communicators might well read these five descriptions as explicit "charges," indicating the expectations of both users and employers:

- Content is dynamic—The value, validity, and credibility of information produced in our networked age is tied to its ability to stay fresh, and to be subject to ongoing revision; there is a growing distrust of the static page not based so much on our traditional notions of editorial authority, but on our preference for a more recently produced, more thoroughly or diversely reviewed/published, version.
- Content is customized—Recalling familiar advice, a bit more emphatically stated: know your audience, intimately, and make your information subject to change based on their specific needs, preferences, environment, or some combination of all of these things.
- Content is linked and distributed—The link, that is, the relationship between one piece of content and another, is often more valuable as a unit of information than what is on either side of that connection. Building relationships among existing pieces of information is as valuable for content providers as it is for users because the strategy of reusing information to ensure consistency of experience and/or trust in the validity of content is a way to both preserve and enhance the value of information.
- Content is granular—We have often faced what appears to be a paradox as technical communicators: We aim to both maximize our ability to reuse information and make it as customized for each individual as possible. Although difficult, this dilemma is resolvable if we are careful to understand the macro- and microstructures of the content we want to deliver. The grain size of content delivered online is getting smaller and smaller as we seek to understand both the semantics and the purpose of information down to the individual word or symbol, in some cases.
- Content is interactive—We have long seen our efforts as technical communicators as supporting the tasks of users with functional documents and information; content and tasks begin to merge at the level of the user-interface such that we must consistently ask how the words and images, along with objects such as buttons and sliders, we specify for an on-screen display will provide the support a user is looking for.

The previous list is all the more powerful a description of content on the Web when we consider that it is the combination of all of these features, not simply the emergence of one or two, that truly characterizes user expectations for information on the Web. This list echoes a more specific list of dimensions articulated by Bernhardt (1993) well before the widespread growth of the World Wide Web. In that piece, Bernhardt began his list by emphasizing that texts are "situationally embedded," a quality that speaks to the way users access, view, and interact with a physical document as well as the information the document makes available. To put it simply, users or readers of a document are typically engaged in some task that influences the way they use that document. Of course, understanding what kinds of task situations users are likely to be involved in doing has always been an important step for authors of technical documents. Usability testing often aims to ensure that documents are well-suited to support users' tasks, in fact. But there is an implication in the more simple statement "texts are situationally embedded" that bears further consideration early in the authoring process, during the development of interactive documents.

INTERACTING WITH DOCUMENTS

People who use texts in the context of some activity (e.g., to make a decision, to look up a reference, or to guide physical performance of a task) interact with and, in some respects, alter the physical structure of the text to suit their purposes. In the context of hypertext systems such as the World Wide Web, it is easy to see how this sort of interaction happens: Users click on some links and avoid others; they scroll down or across, or avoid scrolling altogether. As a result, readers may opt out of sections the author felt were important. They may also disrupt complex structures meant to sequence a task (e.g., by coming in at the "middle" of a set of pages via a search engine) or short-circuit rhetorical moves made by the author by skipping long passages, turning off the feature that allows the browser to display images, and so on.

Even with print documents, users make decisions about what to physically and cognitively access in a document. If all of these decisions are taken together, they create a kind of alternative structure applied "over" a document that reflects logics and/or desires related more to the task at hand, perhaps, than the author's intended organization of the document. How many of us have skipped to the end of a novel to read the ending first, perhaps to help us decide whether or not the book was worth purchasing? I have, without even thinking about it. Effectively, I rearranged the book to suit the task at hand—determining if it was worth buying—a decision that apparently calls for some information about the "payoff" the book provides before I, myself, pay off the cashier.

In the next section, I will call the pieces of information that users find useful in a given task situation "objects." I will also talk about relationships among objects and how these form the structure of a text as we understand it from the author's point of view. But understanding objects and relations is not sufficient if we want to create texts that transform to meet the needs of specific users. To do this, we need to also consider the concept of a "view." A view comprises the task circumstances and display conditions under which users of a document actually encounter text objects.

SEEING THE TEXT, DIFFERENTLY: OBJECTS AND VIEWS

The term *object oriented* is a popular one in the area of software engineering, as it refers to a powerful and efficient modular approach to building complex applications. Object-oriented (OO) programming languages provide for the definition of chunks or modules of code, "objects," which have certain features and functionality associated with them. Applications are built by combining objects together, a process that allows both the computer and, ultimately, the machine running the application to reuse objects when it is appropriate to do so. Developers take further advantage of the possibilities for reuse by exploiting the ability to create generic objects that can be used in many different situations and applications, such as a "window." Each time a developer needs to create a window, she can call on the generic window object for all of the basic features (in OO terms, we say that the new window "inherits" the qualities of the object that is its "parent") and, if necessary, she can define further specific features and functions as well. The new window object can then be defined as a specific type, or "class," of the generic window object and, if necessary, called again.

The reuse benefits developers enjoy from OO programming languages are fairly easy to understand. Developing in an OO environment saves the development team time and permits them to focus much of their resources on solving the unique problems of a given application rather than creating and recreating the more familiar features. Users benefit as well, because applications that reuse the same generic objects—especially those associated with the user-interface, or "externals," of the application—look, feel, and operate like one another. A consistent user experience within and across applications is much easier to achieve, therefore, with OO development methods than it might otherwise be. And it is precisely this goal, that of achieving a consistent user experience, with which technical communicators can relate. To that end, we can apply many of the basic concepts behind object-oriented development to the design of documents, including the notion that a text is, itself, a collection of "objects."

The idea that a text can be understood as a collection of objects related to one another in various ways is made most obvious, perhaps, when we simply look at a document as a physical artifact in the world. Squint your eyes and peer at a printed page, for example, or better yet view a document page shrunken down to a thumbnail image and you can quickly begin to understand how we might say that texts are made up of "objects" that we can discern, name, point to, and relate with various tasks that the document supports. The document thumbnail image in Fig. 1.1, for example, shows what appears to be a list. Even without knowing the specific contents of the list, we can identify a few objects that are visible, giving them names that correspond to common text structures: list items, list item symbol (e.g., bullet), name of item, and description of item.

If we knew what kind of document this was and could thereby infer more information about its function, then we could give these objects semantic names

FIG. 1.1. Document thumbnail image.

indicating their purpose and/or meaning. For example, if we knew the document to the left was a "lunch menu," then we might assume that the "name of item" object is a "lunch entrée name." Why do I guess entrée? Other list items that might appear on a lunch menu (e.g., appetizers, side dishes, beverages, etc.) would not likely warrant such lengthy "descriptions." Descriptions, then, are another type of object I can see and guess the function of simply by looking at the thumbnail. I can also tell, based on their proximity to the "lunch entrée name" object, that these are somehow related to that object. Taking this a step further, entrées at most casual restaurants would not likely be accompanied by descriptions this long, which perhaps indicates something about the context in which we could expect to see a menu like this one. All of this information comes from simply seeing the text.

Bernhardt (1986) offered a detailed analysis of the ways users interact visually with texts. Bernhardt showed how authors enact complex rhetorical strategies not only by making careful word choices, but also by making compelling visual choices such as where to locate items in physical proximity to one another. These visual arrangement decisions influence whether and how users of a document will see various objects as related to one another. Kaufer and Butler (1996) adopted a linguistic perspective from which to understand documents, or any bit of written or spoken discourse for that matter, as a set of objects and relations among those objects (p. 100). Seen from this point of view, every time writers or speakers construct an utterance, they do so by selecting linguistic objects and placing them in relation to one another. By combining simple objects such as words and phrases, more complex objects are created such as sentences, paragraphs, and whole texts (p. 101).

As the discussion of the thumbnail image in Fig. 1.1 illustrates, there are different ways to characterize the objects that make up a text. Describing structure using syntactic or genre-related units is one approach. Another is to describe semantic units, giving them names that correspond to their purpose. Text analysis usually includes both types of naming, in fact, because whereas a text's physical structure is fixed, the semantic structure is fluid (Brown & Duguid, 1999; Colomb & Williams, 1985). The combination of these two features accounts for texts' ability to cross contexts and accommodate multiple audiences, purposes, and instances of use.

Despite the apparent complexity of this layered structure, users or readers of documents are remarkably good at making sense of a text, especially if they encounter the document within a particular use context for which it is well-suited. How do users do this? They do it visually, at least in part. That is, readers access and understand the structure of a document by viewing it. Even very high-level views can be meaningful, as the example of the document thumbnail image shows, especially within a specific context.

Even for texts encountered in print, a "view" is perhaps the term preferable to "page" for indicating the basic building blocks of a text from a user's point of view. Facing page layouts, for example, regularly take advantage of a user's ability to see more than one page at a time in order to enhance the usefulness of a display. Conceiving of a document as a series of views—each of which is made up of objects related to one another in ways made evident in the structure of the view itself—is the beginning point of shaping texts that transform. In fact, when texts are conceived of as a series of views in this way, "using a text" becomes a matter of interacting with the document in order to access existing views and to produce new views as a given task may require. Have you ever taken the staple out of a photocopied document so that you could bring together two nonsequential pages, say, to help make a comparison? If so, you constructed a new view using the objects the text made available. The remainder of this chapter examines a specific document in order to show how technical communicators might manipulate objects, object relationships, and views in an effort to create more user-appropriate information on the World Wide Web.

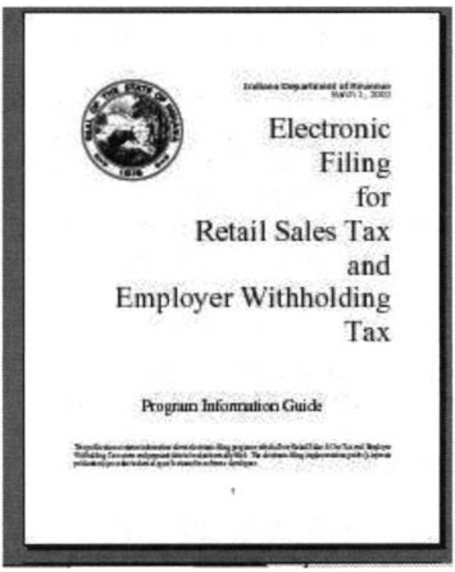
IDENTIFYING OBJECTS AND VIEWS FOR TWO DISTINCT AUDIENCES IN A GUIDE TO ELECTRONIC TAX FILING

About the Electronic Filing Guide

In 2000, the Indiana Department of Revenue (IDR) published a document entitled *Electronic Filing for Retail Sales Tax and Employer Withholding Tax: Program Information Guide*, which, hereafter, I refer to simply as the "Electronic Filing

Guide," or simply "the guide" (Fig. 1.2). The purpose of the guide is to provide information about electronic tax filing programs that "allow Retail Sales & Use Tax and Employer Withholding Tax return and payment data to be electronically filed" (p. 1). Electronic filing, in this case, is typically an automatic feature built into a taxpayer's (here, a business entity rather than an individual) financial accounting system. Through a freely distributed software program that IDR provides called IN-S.I.T.E. (Indiana Department of Revenue System for Interchanging Tax Data Electronically), taxpayers may transmit filing data and payments via electronic funds transfer directly to IDR. The Electronic Filing Guide, a 19-page document distributed in Adobe PDF format on the IDR website, gives both procedural and conceptual information about IN-S.I.T.E. and the associated IDR programs.

It is readily apparent that there are at least two distinct audiences for the guide whose information needs vary substantially. One audience consists of in-house tax professionals or third-party tax consultants who perform the kind of reporting and payment tasks that the new IDR programs are geared toward. A second audience consists of in-house or third-party information technology personnel who would be involved in the setup and operation of the electronic filing system and protocols. Although the guide is not a step-by-step technical implementation manual (there is, in fact, a separate document that serves this purpose), it nonetheless contains important information for software developers, network administrators, and IT managers as well as accounting and legal personnel who we might typically associate with tax departments.



Electronic Filing for Retail Sales Tax and Employer Withholding Tax

Program Information Guide

FIG. 1.2. Electronic Filing Guide.

THE CONTENT OF THE ELECTRONIC FILING GUIDE: JUST THE FAQS, MA'AM

The overall organization of the document follows, for the most part, a familiar formula for information published on the Web: Frequently Asked Questions, or, as some have come to call them, "Fabricated and Answered Questions." This tongue-in-cheek reference alludes to what is missing from many FAQ lists that makes FAQ a popular and potentially valuable format for the Web: Information is audience and task oriented (i.e., if it is a genuine FAQ) and it is typically chunked, labeled, and grouped in a way that makes its purpose and structure (i.e., Question–Answer) readily apparent. The proliferation of FAQ lists on the Web is no accident, then, as the genre seems very well-suited to the kinds of reading that Web users typically do. You can scan a list of questions quickly, locate and click on the one that most closely matches your own query. In most FAQ layouts, you needn't scroll or click through pages of information to get to the answer either. A click on the question takes you right to the answer.

The FAQ list that makes up the majority of the table of contents in the Electronic Filing Guide, however, is probably not the best choice for an overall structure for several reasons. First, the PDF document is not formatted with hyperlinks to allow for the kind of scan-and-click navigation discussed earlier. As with most PDFs, the guide is essentially presented as a print document. Second, and more importantly, the document's questions turn out to be an amalgam of concerns that both distinct audience groups might have. Figure 1.3 lists the sections in the table of contents. A few problem areas jump out right away when we examine the table of contents. Why is "Getting Started" on page 14? Why is the Application Form part of the Guide and not a separate document? Both of these questions, among others, turn out to be important things to ask as

WHAT IS ELECTRONIC FILING AND WHY SHOULD I USE IT?	3
WHAT IS EFT and ITS RELATIONSHIP TO ELECTRONIC FILING?	3
HOW DOES ELECTRONIC FILING WORK?	4
HOW WILL DUE DATES BE EFFECTED [*sic*] BY ELECTRONIC FILING?	5
HOW WILL MY INFORMATION BE SECURED?.	7
REGISTRATION and SIGNATURES	8
IN-S.I.T.E. OVERVIEW	10
IS IN-S.I.T.E. THE ONLY WAY?	
GETTING STARTED	14
A WORD ABOUT COUPONS	15
CONTACTS	16
ELECTRONIC FILING APPLICATION (Form EF-APP-1)	17

FIG. 1.3. Electronic Filing Guide table of contents.

this document causes confusion beginning from the first paragraph in the section called "What is Electronic Filing?"

> Electronic filing, simply defined, is the computer-to-computer exchange of information between two entities. Business documents—including tax returns and payments—are communicated in formats understandable by all parties involved in the exchange. Exchange formats generally fall into one of two categories—proprietary and standard. A proprietary format is one designed and agreed upon by a finite universe. Non-proprietary standards, particularly national and international are formats preestablished by organizations such as Accredited Standards Committees (ASC) appointed by the American National Standards Institute (ANSI) and others. IN-S.I.T.E. exchanges data with the Department of Revenue utilizing ANSI ASC X12 standards. (p. 3)

In this paragraph, we start to see the dual audience issue emerge right away. There are answers here to the overarching question "What is Electronic Filing?" for both, and perhaps a generic third audience of readers. The first two or three sentences seem to be addressing a general, nontechnical audience of people we might classify as "decision-makers" in an organization. We know this because we are given a very basic, yet subtly persuasive, treatment of electronic filing as a seamless process of data exchange made possible by an agreed-on standard. But, beginning with the sentence that starts "a proprietary format is . . ." we can detect an audience shift, especially when we encounter the phrase "a finite universe." Universe!?! This is a technical term understood, perhaps, by network administrators. But, it is an odd choice, it would seem, for tax accountants or financial managers.

The most perplexing sentence in the first paragraph, however, is the very last sentence wherein the first mention of IN-S.I.T.E. marks the beginning of a recurrent pattern in the document: mixing broad conceptual and procedural explanations with more technical explanations without explaining how (or if) the two types of information are related. In the aforementioned paragraph, for example, the first appearance of the IN-S.I.T.E. acronym in the document does not include an explication of it, nor is it clear that the term refers to a software application rather than a policy or program initiative. In fact, the acronym appears 20 times in the document before it is finally spelled out on page 10 in the section entitled "IN-S.I.T.E. Overview." The question is, why? The answer, I believe, goes a bit deeper than just "bad writing." It has to do with difficulty in creating audience-appropriate objects and views for several different audiences in a document that adheres to print format conventions.

IDENTIFYING AUDIENCE-APPROPRIATE INFORMATION OBJECTS IN THE ELECTRONIC FILING GUIDE

Why is the Electronic Filing Guide such a confused document? I will submit that although the execution of the FAQ as an overall organizational strategy for a print document is a bit shaky, it is nonetheless a sound approach, overall, for arranging information accessed on-screen. It certainly seems likely that the guide will be used by both groups to answer questions that arise, for example, when considering whether to use the IN-S.I.T.E. software or in determining how best to use it. The trouble comes when we realize that both groups might be using it to answer both types of questions! For example, IT managers might want to know how the system works before deciding to adopt the software rather than develop their own in-house system. Tax preparers may want to see what kinds of routine reporting tasks will be automated by the system before deciding if it is a worthwhile solution to adopt, and so on. In short, both groups are likely to bring a set of questions to this document and both are likely to think of new questions as they learn about the system. A FAQ, then, seems like a natural fit, if only because the two basic objects that make up a FAQ list—questions and answers—seem to correspond to the information needs of users of the guide.

With this idea in mind, we might revisit the Electronic Filing Guide and ask a different kind of question to determine how useful or successful it is. If it is truly aimed at both tax and IT professionals, we ought to be able to consistently identify "question" and "answer" objects that exist in the document that seem appropriate for each one. And, as we have seen from the examination of the first paragraph, although it takes some searching, we can in fact do this. Consider another example, this one consisting of a question and an answer. In this example, notice that the implications of both the question and answer are very different depending on which audience group the reader belongs to:

> Will Due Dates and Timeliness Be Effected [sic] by Electronic Filing? Filing returns electronically will not change due dates for tax payments or returns. Taxpayers who remit by EFT via IN-S.I.T.E. initiate the EFT transaction in sufficient time to have funds in the Department's receiving account on or before the due date. ACH debit taxpayers have a warehousing capability that allows them to arrange as much as 30 days in advance for funds to be debited from their account on the due date. The final cutoff for ACH debit taxpayers is 11:00 am. E.S.T. the last legal business day before the due date. Returns without payments may be transmitted as late as 11:00 E.S.T. on the due date. (p. 5)

The answer to the basic question, from a tax professional's point of view, is "No, due dates and timeliness are not affected by electronic filing." For IT professionals reading this paragraph, the answer is something closer to "They shouldn't be, and here's how we ensure that they are not." Effectively, we have two answers here to what appears to be the same question—or perhaps we have two different questions? We can begin to unravel this problem by considering the object structure of this FAQ item. At the most generic level, the object structure of an item in a FAQ list, expressed in a markup syntax often used for this purpose such as XML, might look like this:

```
<faq>
        <topic>
                <question>
                </question>

                <answer>
                </answer>
        </topic>
</faq>
```

In this structure, the basic FAQ entry consists of a "topic" with a "question" and an "answer." We could further assume that a FAQ list contains more than one topic, each with a question and answer—hence we know something about the structure of a FAQ "object" itself.

But what is the purpose of the previous structure called a "topic"? Why not just have a FAQ made up of Questions and Answers? In this example, having a container object called a "topic" allows us to expand the types of questions and answers we might give to a set of related questions based on the types of information that we could expect our users to ask for. Two types we have already mentioned are "conceptual" and "procedural" information, a pair familiar to most technical communicators concerned with developing task-oriented documentation. Another distinction we might make is "technical" versus "policy." So, in theory, we could have an object structure for a FAQ item called IN-S.I.T.E. that looked something like this:

```
<topic>
        <name>INS.I.T.E</name>
        <question class="conceptual">What is IN.S.I.T.E?</question>

                <answer class="technical"> </answer>
                <answer class="policy"> </answer>

        <question class= "procedural>How will payments be made?
</question>
                <answer class="technical"> </answer>
                <answer class="policy"> </answer>

</topic>
```

This structure takes advantage of a key feature of object-oriented modeling, the idea that an object can have a virtual or potential structure that varies from any one specific "instance" of the object that a user actually sees or interacts with. In this way, objects can have a baseline structure that defines the most basic elements for all objects of that type, and it can also have more specific "classes" that inherit the basic structure as well as having a more specific structure indicative of the subtype (Olsen, 1998, pp. 8–10).

In the previous example, the "topic" container object's virtual structure permits the modeling of information related to topics that are of common interest to both target audiences. We have identified question-and-answer classes that both characterize the type of information that the document contains (e.g., conceptual and procedural) and correspond to our user groups' information needs. With this structure in place, for any specific "question" or "answer" that appears in the document, we might choose to display only some of the information available in the given topic structure so that we can customize the "view" of the object for our target audiences: tax preparers or IT managers.

We can imagine, for example, an IT manager who has identified herself as such by clicking on a link or, perhaps, by logging in to establish a customized view of the information in the document. For this user, the answer to the question "what is IN.S.I.T.E?" might be, by default, the "conceptual" version with the default answer being the policy-oriented one. For this user, we might include a link at the bottom of the answer, which asks, "Need a more technical description of IN-S.I.T.E?" Clicking on that question could display a different instance of the same object, this time with the "conceptual" and "technical" flavors of question–answer showing. By modeling the whole document in this way, we can create a flexible underlying structure for the information that facilitates the tailoring of information via the actions and choices of users.

DEFINING OBJECTS AND RELATIONSHIPS AND DESIGNING VIEWS: NEW BASIC SKILLS FOR TECHNICAL COMMUNICATION STUDENTS?

Turning over some of the rhetorical work associated with customizing information for a particular audience to individual readers is an exciting proposition. Both critics and proponents of object-oriented document modeling point out that creating effective structures requires the kinds of rhetorical expertise that technical communicators bring to the table (Albers, 2000; Clark, 2002; Hackos, 2002; Rockley et al., 2002). I would add that an even more sophisticated task is constructing effective views of information, an art that spans all five of the canons of rhetoric that have traditionally described the scope of rhetorical performance: invention, arrangement, style, memory, and delivery. I use an exercise in my own classes that illustrates this point. I ask students to design a new "top-level" view for the Electronic Filing Guide. Here is the assignment prompt:

> Design 2 "information boxes" to sit on the intro page for a new web-optimized version of the Electronic Filing Guide which links to important information the document contains. Your audiences for the two boxes are:
>
> - Financial software solutions providers
> - Tax preparation professionals
>
> You can assume, for the sake of the exercise, that this document is the single source from which to draw information and that it is complete. You are only "pointing" to objects (which you will need to define) that already exist in the document. You may notice that additional material is needed; if so, you should simply note this rather than creating new content. Your task, here, is to design two different "views" of the objects the document contains, one tailored for each of the two target audiences.

The deliverable for the aforementioned exercise is fairly straightforward, consisting of two boxes with links in each. The difficulty, of course, comes in determining the answer to questions such as: What should the links link to? (memory/storage and retrieval); what the labels for the links should be (invention, style); how the links should be spatially arranged and laid out on the screen (arrangement, style); and how much or how little overlap should exist between the content and style of the two boxes (delivery)—just to name few. Despite the complexities of these questions, the task itself is a perfectly reasonable one to ask students in technical communication to engage because it so closely mirrors a process that many organizations are initiating and/or struggling to complete: namely, the conversion of materials from print to Web-appropriate formats. As we noticed on close examination of the Electronic Filing Guide, solving the "delivery" problem by publishing print-formatted files in PDF is not the same as providing a Web-appropriate format for displaying information effectively. This exercise begins to show just how challenging such a task can be, particularly when we consider that it only asks students to deal with one relatively straightforward document that is already well-structured for its intended tasks in many ways. And we are only asking them to consider two of many potential audience groups. What might a conversion of an even more complex document—the whole tax code, for example—be like? Or perhaps the more important question to ask is, "How can we best prepare the technical communicators who will face a task like this?"

RHETORIC AND WEB CONTENT: TOPOI FOR A TECHNICAL COMMUNICATION CURRICULUM

The answer to this last question, I believe, is one that will require considerable thought and, to be certain, further research. I hope that this chapter can serve as one beginning point for such work along with other pieces such as Johnson (1998) and Carliner (2001), just to name two. By combining the rhetorical performance skills suggested by the five canons of rhetoric and the emergent qualities of Web content, we can perhaps begin to imagine many of the critical concepts, skills, and indeed courses we might expect to include in a new technical communication curriculum for the information age. In short, we can develop a rhetoric of Web content development that is informed, on the one hand, by the traditional canons and, on the other, by the features that define quality content on the Web. We could start by drawing straight lines on a chart like that in Table 1.1.

This would give us a list that includes combinations that sound like courses, for example, such as "Dynamic Invention" or "Interactive Delivery." Other combinations point to trends in the field that could be topics in a course, such as "Linked and Distributed Style," suggesting an overview of Cascading Style Sheets or, perhaps, XML Style Transformations. Still others seem to represent means to an end that are still very much in dispute. If we provide a way for users to have "customized arrangement" for their intranet or Internet site, then will it really lead to more effective sites?

If we venture to draw diagonal lines or engage in a Burkean experiment with ratio pairs, triads, or other combinations, then we can come up with even more compelling items for our curriculum. Research issues such as how to measure the quality of online documentation are related to the arrangement of granular content in a linked and distributed environment. Reducing the cognitive load on users engaged in complex decision-making activity involves achieving a delicate and interactive balance between memory and delivery, helping them to manage dynamic information.

It is my hope that technical communication instructors and program directors will engage in this type of inventional work aimed at developing a rhetoric of web content. In addition to talking to partners in industry and comparing curricula with our colleagues, and paying attention to the recommendations of standards organizations, we need to revisit the list of "basics" that we teach students in technical communication. I have argued here that "preparing texts that transform" belongs on such a list. And I am confident that there are other important new fundamentals that we will discover.

TABLE 1.1
Suggested Rhetoric of Web Content Development

Content Qualities	*Rhetorical Canons*
Dynamic	Invention
Customized	Arrangement
Linked and Distributed	Style
Granular	Memory
Interactive	Delivery

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2

From Wordsmith to Object-Oriented Composer

George Pullman
Georgia State University

By accelerating the rate of information exchange, the Internet has accelerated change in many aspects of life that might seem unrelated to the Internet itself. Think of the rate of change in the Dow Jones Industrial Average over the last few years. Advances and declines of 100 points in a day are common now, due at least in part to the number of investors who now do their own buying and selling, made possible by Internet access to trading software and a tidal wave of investment news flowing from the Internet. The Internet has also affected other areas of life. Another manifestation of the accelerating flow of information made possible by ubiquitous and ever-faster Internet connections is the current configuration of information presented by CNN, MSNBC, and Bloomberg, based on a computer-screen metaphor of multitasking. Here the talking head is in the upper right corner of the screen, with a sidebar graphic flush left highlighting what is being said; unrelated information scrolls along the bottom, just above the most recent sports scores, with the weather presented as a graphic somewhere else on the page, while time ticks away bottom right. A screen that busy with unrelated information would have been rejected as chaotic 5 years ago. Now it seems that people have come to expect a steady flow of ever-changing information. Because so much else is going on, one has to tell a news "story" differently. There is very little room left for narrative or for editorial commentary, just for images and sound bites. Given that the Internet has become a pervasive form of communication that is having a formative effect not only on what people do but also on how people think and write, it is not surprising that it has also changed the way that technical and professional writing is taught. Nearly all of us teach in a wired environment, and publication via the Internet has entered the standard curriculum. We all teach Web design to some extent. When we teach documentation, many of us now teach online help. And whereas desktop publishing has made graphic design a significant element of many technical and professional writing courses, the possibilities of movement and color that the Internet enables have encouraged entire courses in visual rhetoric. Clearly, the Internet is changing what we teach and what we know.

Despite these changes, technical and professional writing is still fundamentally about textuality in the sense that it is still focused on unidirectional communication. Even hypertextuality is fundamentally textual in that the flow of information is unidirectional. Even though readers can select what order they want to read the content in, and thus can "determine" what content they encounter, they cannot, using standard hypertext, alter the content as it exists on the server. Recently, however, with the advent of server- and client-side scripting, it is now possible for readers to alter the contents of the text, and as a result, websites are becoming truly interactive: Information now flows both ways. Writing in an interactive environment is different from writing on a static page, and thus we need to develop different writing pedagogies. This chapter has two goals. It argues that technical and professional writing needs an object-oriented writing pedagogy that responds to the interactive potential of Internet-based communications, and it attempts to explain what such a pedagogy might look like.

Changes are occurring in what writing is and how it is done. Consider the genre of software documentation as an example. Because of the vast numbers of people using software, and the capacity of e-mail to communicate directly (and, in some cases, almost spontaneously) with the people who produce it, software engineers get a steady stream of bug reports and requests for added features, and as a result, software changes on an almost daily basis. Also, because it is economically more feasible to get people to shell out small amounts of money for upgrades delivered online, with the decrease in production costs attending that delivery, many software companies have moved or are moving to a subscription model. You pay a certain amount in advance for regularly scheduled upgrades that arrive online. Because the software is constantly changing, the documentation has to change constantly as well.

A few years ago, I cowrote a user manual for a piece of accounting software. Before the first edition was in the hands of customers, we were already planning a second edition because release 2.0 of the software was on the way. The following year, the accounting firm that made the software wanted the manual online. But, by then, the costs of production and implementation and softness in the economy made hiring outside writers too expensive, which meant we were out of a job. Still, I can imagine what happened next. Because the software was changing on a daily basis, in response to user experiences and industry changes, production of the manual would have had to be automated. Instead of shipping the software, the company would begin offering the software for download, with a special update feature that would, at the user's request, search for and replace the older files with the newest files. Thus, the user would not so much buy as lease the software, and the software would become more of a service than a product. This subscription model would have meant major changes in the user documentation. For one thing, the documentation would not be shipped, but would be stored on the accounting firm's server. As the software changed, the help files changed. The people making the software (it was an elaborately customized and customizable database) were thus making the help files, and the help files were themselves becoming a dynamic database. Click on help and you leave your machine and head for one 1,000 miles away. Click on help again tomorrow, and what you find 1,000 miles away may well be different from what was there yesterday.

The open source software movement has taken this transformation of documentation even further by de-centering the production of documentation. With many people all over the world tinkering with the code, and some groups of people spinning off transformations of the code, the documentation becomes the work of many people and not all of them are documenting exactly the same thing. Thus, the FAQ and the threaded discussion list powered by software like Nuke or Slashdot offer alternatives to traditional manuals of documentation that may be preferable, especially to younger users, because these resources are not only electronically searchable, but are also resources created out of multiple users' first-hand experiences. The traditional manual is not yet obsolete. Witness the number of books on how to use DreamWeaver, for example. Nevertheless, documentation is increasingly dynamic and multivocal.

The multivocal character of the Internet is most commonly exemplified by the guest book, but an increasingly popular variation is the Web log, or "blog." Originally, the blog was a way of communicating personal experiences to the Web, but most blogs now include a comment feature that enables people to write in response to what they have read, and many blogs represent the writings of multiple people. There are also tools that make it possible to comment directly on the contents of a copy of a Web page. For an example, have a look at http://www.annotateit.com/cgi-bin/nph-proxie.cgi. These sorts of technologies are increasing the opportunities for information to flow both ways, rendering the Web "page" multivocal. "The writer" is becoming one of many people participating in the construction of a document, which might be said to belong to an enterprise or group rather than to a single individual.

WRITING FROM AN OBJECT-ORIENTED PERSPECTIVE

Just as the meaning of "writer" is changing, so is the meaning of "text." Server-side scripting enabled by programming languages like Perl[1] and PHP[2] has transformed many web "pages" into data repositories. The data that drives such sites is sometimes gathered robotically from other sites, displaying the current weather, for example, or stock prices, or photographs of the current traffic conditions. This means the writers have to compose in order to accommodate information that is not yet present and that will change on a regular basis via machine intervention. If we are talking about a date stamp or a part of the screen that displays the current weather forecast, then we are not talking about a revolution in composition practices. But, if the information being supplied to the users is about how to use a piece of software or how to perform a complicated mechanical procedure, and the information is being updated by a machine as the system being documented changes, then traditional notions of audience and purpose have to be rethought. The possibility of automated writing processes arose at least as far back as 1996, when Wieringa et al. (1996) observed that procedures manuals at a nuclear power plant could be tied to the central database, although "there were substantial administrative and practical hurdles to making this system work, and the feature had to be modified so that updates were performed explicitly by writer request" (p. 150). I suspect that some of these hurdles may have since been minimized by improvements in scripting technologies.

I recently received an e-mail from a graduate student who works in the documentation department of a multinational corporation. He told me that his corporation had announced that it was going to abandon RoboHelp and its other software packages for producing documentation and turn to a new suite of tools created specifically for mining their databanks. According to this student,

> This is going to be an interesting experience because we've already been told (in a preliminary meeting) that, when we write using this tool, we need to write "to the object" rather than to an audience. These information "objects" that we write will be sliced and diced and recombined in any number of documentation formats (help, quick references, user guides, training guides, job performance aids, etc) and translated into various languages. I think it's the necessity of writing and translating a

---

[1]Perl is an acronym for practical extraction and reporting language. It is used primarily to manipulate text for storage and representation on the Web. Whereas the idea of learning a programming language is daunting, there are many very helpful, project-oriented books available. *CGI* 101 is an excellent place to start. See also *The Perl Cookbook.*

[2]PHP is a recursive acronym for Hypertext Preprocessor. It is a free alternative to Microsoft's Active Server Pages and a common tool very commonly employed to connect website forms to databases. *PHP Essentials* is an excellent introduction. Also, *Web Database Applications.* Another good source for information about PHP (and Perl) as well is http://www.hotscripts.com.

> huge amount of documentation in a short period of time that caused management to look into [technologies that would enable this kind of writing].

This technical writer went on to say, "I'm a little concerned with the idea of writing in order to create reusable information objects. In some ways it is similar to the modularity offered by the ASP user assistance I discussed in the article I sent you, but I think the end results may be very different and perhaps quite system-centered. I guess I like the concept and will probably enjoy working with the technology, but I'm leery of any system that tries to automate the creation of user assistance."

I suspect he's not alone in being leery of automated writing. Given the rate of technological change, the amount of specialized knowledge required to write for online delivery—visual rhetoric, usability, multiple software packages all of which are regularly changing, and, as I am now asserting, server-side scripting, to say nothing of automated creation of user assistance—it is tempting to want to return to the language skills-based technical and professional writing class. In this kind of class, one teaches prosaic virtues, such as "clarity," "brevity," and "the given/new distinction," along with the "genres" of technical and professional writing—the white paper, the annual report, the technical report, the design specification, and so on. Content is king, as everyone says, and although the vast demand for technical people is slowly being supplied, the absence of people who can do research and write readable prose about it is palpable. With so much "bad" writing out there, it seems reasonable to focus on the writing and the genres, especially because that is how most of us were originally trained, and there are departments all over campus that do the other things, whereas only English and communications can be said to teach writing per se. There are, however, problems with continuing to do what we have more or less always done. Wordsmith is a lowly occupation with little room for advancement if it is not grounded in technological savvy. People who do not know how to learn new technologies are severely limited in what they can document, given the amount of technical documentation that must be done. Moreover, by allowing would-be technical writers to remain tied to unidirectional prose composition, to textuality, we are perpetuating the metaphor of the book and binding students to textual ways of thinking, while writing for online delivery involves a fundamentally different way of thinking and writing.

From a textual perspective, the technical writer's job is to report, create, and shape content. The preferred method of arrangement is branching, so that different kinds of readers can find the various things they need in the material to do their particular job. The advent of hypertext has made it much easier to leap from branch to branch, and made it feasible to actually leap from tree to tree, allowing people to leave the current "document" in search of authorized or unauthorized supplements to the current text. One can of course do the same thing if one reads in a library, but a fast Internet connection accelerates the process. But how can one write if the content is constantly changing, being supplied by different people from different perspectives, and in some cases being supplied not by people at all but by machines? What does it mean to "write to an object instead of an audience"? It means discovering how text differs from data and learning object-oriented composition.

To conceptualize the difference between text and data, take a phonebook for (a simplistic) example. From the traditional writer's point of view, it is the story behind each name and number that is of particular interest. From the traditional technical writer's perspective, what is interesting is the layout of the items on the page, the creation of multiple groupings (by name, by job description), the selection of a legible font, and the inclusion of useful icons. From the perspective of web writers as they are currently trained, layout is also of primary interest, but so is advanced searchability. Whereas the alphabet is the only technology available for printed phonebooks, one can of course search via name or number in an electronic phonebook. For an excellent discussion of the importance of representing data, see Mirel (1996).

But the Web actually offers much more than a superfast search facility. It offers the chance for individuals to edit and update their own address information. It also offers users the opportunity to view the page from different perspectives. As a result, the databased object-oriented technical writer is still interested in the surface of the "page," but only in relation to the structure of the data behind it and what can be done with that data. Phone numbers in a phonebook are only interesting in relation to the person or people associated with them. But, in a database, phone numbers could be grouped and new information derived from that grouping. In Atlanta, Georgia, for example, because of the population explosion, an area code actually says something about when you received your phone service and not necessarily where you are located. By figuring the ratio of 678 area codes in your database/phonebook, you could determine how many of your entrants have new phone numbers. One could, of course, count the area codes in a printed phonebook, but the process would be so tedious and time consuming that unless one were motivated by a captivating hypothesis, one would never bother. The web phonebook does not make counting the area codes any easier, and so just making a hypertext version of the textual phonebook does not facilitate the generation of new information—it accelerates the rate at which existing information can be obtained. Because the database makes querying easier, it can accelerate the invention process, allowing people to pursue information without first determining what they hope to observe. Data mining will, of course, generate junk, but it will also kick up some fascinating pieces of information that no one could have predicted.

Writing from an object-oriented perspective means thinking about content as dynamic information that can be re-purposed by users and altered by both users and machines. In practical terms, this means emphasizing the separation of style and appearance from form and structure when teaching people how to write for online delivery.

TEACHING OBJECT-ORIENTED WRITING

One practical way to teach object-oriented composition is to teach technical and professional writing students about Extensible Markup Language (XML), and to show them how determining the essential structure of a given kind of document, along with designing a tag set for such documents, enables one to see text from the perspective of searchable data. One can see that such text can also be re-purposed easily by altering the style sheet, while leaving the form untouched.

For example, an HTML phonebook entry might look like this:

```
<p>George Pullman</p>
<p> Jon-Jeff Drive</p>
<p> Lilburn, GA</p>
<p>30047</p>
<p>770-923-9919</p>
```

However, an XML phonebook might look like this:

```
<entry>
<first_name>George</first_name><last_name> Pullman</last_name>
<street_address> Jon-Jeff Drive</street_address>
<city> Lilburn, </city><state>GA</state>
<zip>30047</zip>
<hphone>770-923-9919</hphone>
</entry>
```

The layout for this code would be handled by a separate file that would basically accomplish what the <p> tags do in the HTML example. But the XML example has the appearance of a database. Moreover, because the information is structured in this way, it can be transformed by means of style sheets to present different elements for different purposes, or to select elements for particular purposes. One could, for example, just present the names and the phone numbers. Or one could just list the zip codes.[3]

If introducing XML seems a daunting way to introduce students to the difference between composing text and writing for data, then you might consider showing students how constructing a bibliography using a word processor is much less efficient than using a database program like EndNote or Citation. When building a bibliography using textual methods, one types in the entries in alphabetical order. The more computer literate one is, of course, the more automated the re-entry process. One can cut and paste from previous instances, or keep a running bibliography from which to cut and paste. Still, the formatting is determined by the writer, given

[3] There are a number of very readable books on XML. See, e.g., Turner, 2002, and Pitts, 1999.

present circumstances such as a default style sheet like MLA, for example. If for some reason the author needs to then transfer the information to a different citation style, then it has to be retyped. If the circumstances of publication were rigidly consistent, then this would not be much of a threat, but because there are many different style sheets, it is a valuable asset to be able to quickly re-cast one's bibliographic format. The programs can also search and download potentially relevant sources from remote library databases, which means users can assemble and list potential sources from the Library of Congress without being there, and without entering the information themselves. Although some time must be spent learning the software, and one's writing process may even be altered as a result, the time is recouped the first time an editor requests transferring Chicago style to MLA style. The real advantage, however, of discovering and incorporating such software into one's composition practices, comes from perceiving textual references as data that can be acquired automatically and recompiled at will.

As software becomes more "user friendly," more people are expected to use it to do tasks that were not long ago considered the purview of experts. Desktop publishing is a classical example. Web design using FrontPage or DreamWeaver is a more current one. And if you have seen the latest release of DreamWeaver (DMX) and noticed that database connectivity is integrated into the system, it is obvious that businesses and design studios are building datacentric sites. If our technical communication students are not completely confident using information technology, then they will be severely disadvantaged in the workplace. We cannot, however, simply teach specific software applications, because they are outdated upon graduation. And, more importantly, knowing how to use an application does not necessarily enable you to pick up the next application or foresee it on the horizon. Technical and professional communicators have to be immersed in technological ways of thinking, and among other things, this means learning to think about writing as an object-oriented composition practice that creates data structures, while thinking about text as reusable chunks of information.

A SAMPLE COURSE OUTLINE FOR TEACHING OBJECT-ORIENTED WRITING

What follows is a rough outline for an upper division technical writing course that presumes students have already taken at least three university-level writing classes and a class in electronic writing (e.g., Comp1, Comp2, Business Writing, and Web Page Creation and Design). This presumption is regularly thwarted at my institution because there are few ways of checking prerequisites and so inevitably there is a broad distribution of skills. But, if students are computer friendly and can write reasonably well, then they are ready for such a class. I would warn students, however, that a class like this is not for the computer phobic. I'm regularly amazed by how unprepared some English majors are for this kind of work, but many catch on quickly, and in general, I would say that nearly everyone who does not immediately abandon the class eventually acquires a new skill set.

The goal of this course is not to teach database design, website creation, or the use of specific software applications, but rather to teach people how to teach themselves to use different kinds of software in order to solve an extended rhetorical problem by thinking about writing from a data perspective. To think about writing from a data perspective is to think about each writing situation as a rhetorical problem, the solution to which consists of a document or documents that can be analyzed into parts; these parts can be written and stored as discrete chunks of information to be drawn on in other contexts, and perhaps later reused for other than the immediate purpose. By coming to understand writing as the creation of reusable parts, students come to see writing from an object-oriented perspective.

I suggest that the sequence of assignments be done as a group project over the course of a semester, with grades being determined at the end of each stage. And I suggest that instead of teaming up people of disparate skills, with the idea that the stronger will strengthen the weaker, it is better to ascertain first who has what kinds of computer equipment, who has how much dedication and how much time, and then group people according to similar likelihood of success. This, in my experience at least, minimizes the resentment factor among the harder working students. It also means, of course, that some groups may fail.

Basic Design Scenario

Small businesses and nonprofits often need people who can multitask. Increasingly, documentation projects are being in-sourced among technical writers who must know how to do far more than create visually appealing line drawings to accompany succinct texts. Thus, a student hired in business communications might well be asked to research a market by designing a questionnaire to gather data; design a web-based mechanism for gathering that data; design a relational database to store, sort, and represent that data; and design a hypertext help file that would enable others to use one or all of the pieces of this communications suite.

Thus, the assignment asks students in groups of two or three to locate a business or program on or off campus that would benefit from some web-based market research. Then the student groups do the following:

- Interview members of the business or nonprofit to discover what information is needed
- Design a survey instrument for gathering the data
- Design a web form that would facilitate gathering the data
- Get sample data
- Design a relational database for the sample data

    - Tables
    - Forms
    - Reports
    - Import filters
- Import the sample data and generate several different reports for the business based on what the sample data shows
- Write a help-file that explains how to keep the database going and use the data that it provides.

Here is a more concrete representation of how the assignment might play out. A group of students decides to interview a subgroup of faculty to discover what they might want to know about their students, given the premise that students can be perceived of as a market, and thus that teachers can better teach if they better understand the market. So the student group interviews the faculty to discover what they would like to know about existing and potential rhetoric and composition students.

Interviewing the Clients

Good listening practices are a critical part of any effective communication. Technical writers need to be able to gather what their clients want from asking useful questions and making good use of the answers one gets. At this point in the process, the students have to generate a list of likely information the clients might want to generate. They must also get a sense of the business and the likely communication and marketing needs of their clients. Equipped with this set of possible questions, the students arrange for a meeting to discuss the client's data needs. They ask questions, take notes, discover the look and feel of the client's documents (so as to blend), and then they agree on a set of data points to be gathered—a set of questions that the client's customers might be expected to volunteer—and if there will be any remuneration for the clients. For instance, if the clients fill out the form, then their name might be entered into a drawing for a free website.

In this example, the students discovered that the faculty would like to know basic Rolodex information (names, addresses, e-mails) about their students and potential students, so that they could e-mail flyers to them. They also would like to know about current courses taken by the students, career aspirations, expected dates of graduation, knowledge of rhetorical principles, and software familiarity. The students and the faculty decided that the faculty would ask that the students in all their writing classes to fill out a form as part of their class activities, to gather the desired information. Thus, power is used as a substitute for bribery or promises of sweepstakes windfalls. Once the questions are determined, and the mechanism for getting the sample data (or the real ongoing data collection process) is worked out, the student groups write up this information and transport it in an e-mail to the faculty clients, requesting that the clients sign off on the present design or offer suggestions for revision.

Designing the Survey

Next comes the design of the survey, and here one discusses basic survey techniques, usability, ambiguity, yes–no versus real questions, leading questions, and so on. The students have to design a paper survey that will gather the information desired by their clients. They must then test the survey to make sure it does gather what is desired, and that it can be filled out with only as much effort as the target users are likely to be willing to invest. Once the survey has been tested, it should be sent to the clients for approval.

Creating the Mailto Form

From here, students will turn the paper questionnaire into a Web-deliverable e-mail form. There are, of course, several technologies for doing this, everything from a simple action=mailto to a perl script that gathers the data, prints it to a file and then to a web page (see Appendix A). Because the goal of the class is to push students beyond what they think they can do with computers, I think students should be encouraged to find a cgi script that will process the form and write the data to a web page. Such scripts are readily available on the Web (http://www.free-scripts.net). There are sometimes implementation issues to work out in advance, as many systems are designed to preclude or limit the use of such scripts.

There are also significant ethical issues that arise at this moment, which provide a concrete place for discussion. If one has downloaded a freely available script from the web, then is it ok to essentially sell it to a third party as part of a larger project? (No, obviously, but the point is to have the discussion take place in the context and under the pressure of a real work scenario. Fortunately, the students are not selling their work, so they are off the hook in this case, but what are the clients' intentions? And so on.)

Also, because one is gathering personal information off the Web, one needs a privacy statement, and thus a discussion about the fair and safe use of web-gathered data can take place in the context of actually gathering such data. I bring the significance of this issue home with my students by means of a very simple e-form, which generates a very (very) simple web page containing name, e-mail, and phone number information. At the very beginning of the class, the students are asked to fill in the three-line form, and when they have, they are directed to a web page that displays their personal contact information. We then talk about how having this information readily available is very useful for a class like this, but then we also can talk about having one's contact information on the Web, the relative accessibility of pages, the role that meta tags play in getting the existence of a page recognized, how to get a java script password mechanism for the page, and so on.

As with all other aspects of the assignment, the goal is to get the students to think about specific issues in the context of concrete practices.

Creating the Database

The database is the next assignment. Students are required to use MS Access[4] to build a database that can store the information gathered by the form. Because they know in advance they are going to have to do this, they will tend to limit the information they intend to gather, ultimately simplifying the database to the point where it can be a flat file rather than a relational database. If there are computer science majors in the class, they can elevate the project, but the point of the assignment is for the English students to look beyond word processing, to teach themselves a new application, and thus to discover that they have what it takes to adapt to technological change.

Creating the Hypertext Help

And, finally, the students create a hypertext document that explains how the database works. Because the goal of the project is to create a communication mechanism that will be updated by users and left running even after the students have left the class, some documentation must exist for the new keepers of the mechanism. They have to know the names of the relevant files, how they work, where they are, and so on. Also, the e-form itself has to be usable. Thus, usability and software documentation become topics for concrete discussion. Can the clients use the form? Can their target audience?

CONCLUSIONS

The accelerated rate of change of software and hardware makes specific applications transitory. If students have merely learned to handle specific applications, then by the time they graduate, their skills are obsolete. What lasts is the ability to learn new technologies and to anticipate changes in techniques and practices. We need to teach students how to anticipate change and how to teach themselves new techniques and technologies. The most successful technical communicators will be those who are continuously updating themselves, by themselves. In addition, and finally, it is critically important that those of us who teach technical and professional writing start looking for ways to operationalize for our students the difference between object-oriented composition and text-based writing.

---

[4]Actually any database program will do, and MySQL is really preferable because it is commonly used by Internet-based businesses. It is, however, more difficult for novices to learn, and one must also use PHP to connect the website to the database. If you are teaching via DreamWeaver MX and have a PHP enabled server, then this might be a better way to go.

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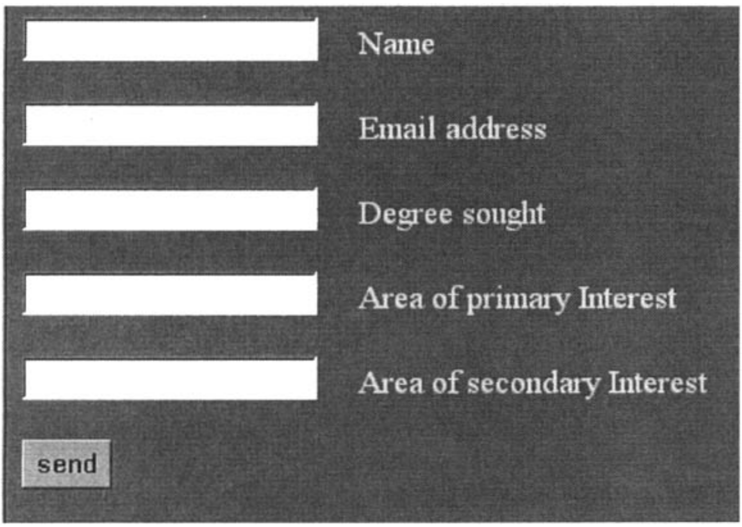
APPENDIX A

HTML Form Processing
HTML Form Processing Using Action=mailto



Then the invisible text looks something like this:

<HTML>
<BODY>
<FORM action=mailto:gpullman@gsu.edu encType=text/plain method=post>

```
<P><INPUT name=Name>Name</P>
<P><INPUT name=Email>Email address</P>
<P><INPUT name=Degree>Degree sought</P>
<P><INPUT name=Primaryinterest>Area of primary Interest</P>
<P><INPUT name=secondaryinterest>Area of secondary Interest</P>
<P><INPUT name=send type=submit
value=send></P></FORM></BODY></HTML>
```

If you are not familiar with HTML, then this code may be somewhat daunting, but it is in fact very easy to generate. Using Microsoft Frontpage, for example, this code would take only a minute or two to create. But, even hardcoding won't take long once the basic syntax is understood.
form METHOD="post" This element tells the machine that the form is to be e-mailed when completed.

ACTION="mailto:gpullman@gsu.edu" This element tells the machine where to e-mail the results.

ENCTYPE="text/plain"> This element determines encryption, if any. Obviously, security is a factor whenever one e-mails information. You should discuss the ethics of e-mail marketing and data-gathering practices in general with your students, but you should also discuss security measures as well.

Input type = "text" This element tells the machine how to handle the information—either as a text or number.

Name = "label for the input" This element labels the information, so that when the results are e-mailed, they will be understandable. (See sample results later.)

Size = "20" This element determines how wide the space is for user input.

>________</p> This element tells the machine to display the text entered between the two brackets and to enter a hard return.

```
<INPUT name=send type=submit
value=send></P></FORM></BODY></HTML>
```

The last string of elements creates the button that says send and which sends the results of the form when it is clicked. To change what is written on the gray button, change the name=send to name= what you want to appear on the button.

Example:
Name = Post would 

create

</FORM></BODY></HTML>
These elements simply tell the machine that the form file is at an end. Any common, contemporary HTML editor will insert these necessary elements automatically.

When the Send (or post) button is clicked by the user, an e-mail message is sent to the e-mail address used in the ACTION=Mailto element. The e-mail that arrives looks like this:

name=George Pullman
Email=gpullman@gsu.edu
Degree=MA in technical communication
Primaryinterest=Web based publications
Secondaryinterest=history of rhetoric
This is a plain text message. It can be copied and pasted into a word processor file, or imported into a database, as we will do in the next section.

The previous form is a simple, workable example. There are several more options, check boxes, drop-down listboxes, memo boxes, radio buttons, and so on. The form can be as complex or simple as necessary. Once you have explained the rudiments, you should send your students off to use the Reveal Source option of their web browsers to ponder forms they find on the Internet. Once they have had a chance to look around, you should discuss with them the basics of Graphical User Interface, specifically the need for brevity, readability, usability, and the interrelations among them.

HTML form processing using cgi and perl

Although the following piece of code may be intimidating, it was in fact very easy to come by and to modify. I found the original on the Web, using a typical search engine looking for "perl print to file." (I haven't included the URL because by the time this is printed, it may be gone.) I then modified the script to include the information I wanted to gather and use. I then put this file (called addresses.pl) into my cgi-bin and changed the permissions to 777 (a+wrx). If none of this makes any sense to you, then don't bother with it, but don't let it keep you from heading out on the Internet to find a better explanation. Believe me, if I can do this kind of thing, anybody can.

Next is an example of code that uses a perl script (addaddresses.pl) to print the data's form to a file. One could quite easily modify this script to send e-mail as well. Many things are possible and in most cases easier than one might think. The html form part is only superficially different from the previous pure html example. The only significant difference is that instead of having an action=mailto statement, it has action=the url of the perl script that gathers, parses, and prints the data.

```
<HTML>
<HEAD>
<TITLE>George Pullman's Class List</TITLE>
</HEAD>
<BODY bgColor=#ffffff>
<P>Please fill out this form and press the submit button. If you ever want to
send classmates e-mail or call them, then you can look them up on the <a
href="addressbook.pl">results page</a>. (You might need to hit refresh.) </P>
<FORM action=http://jac.gsu.edu/cgi-bin/addaddresses.pl method=post>
<P>
<INPUT type=textbox name=fname>
First Name<BR>
<INPUT type=textbox name=lname>
Last Name<BR>
<INPUT type=textbox name=email>
E-mail Address (the one you check most often)<BR>
<INPUT type=textbox name=phone>
Phone Number<br>
<INPUT name=url>
URL<BR>
</P>
<P>
<INPUT type=submit value=submit name=submit>
</FORM>

</BODY>
</HTML>
```

----------- IN A SEPARATE FILE CALLED addaddresses.pl ---------

```
#!/usr/bin/perl

# Script to write form information to a file

require("cgi-lib.pl");

# Read referring page from environment variable associative array
$where = $ENV{HTTP_REFERER};

# Read and Parse Form data
&ReadParse;

# Return HTTP Header information and beginning of HTML file
print &PrintHeader;
```

```
print "<HTML> <HEAD> <TITLE>Form Response</TITLE> </HEAD>
<BODY>";

# Check to see if lname field was left blank
if ($in{fname} eq "") {
   print "You left name blank<br>";
   print "Please <a href=\"$where\"> return to form</a> and
complete it<br>";

}
else {
   # Send HTML response back to user
   print "Thank you for submitting your contact information:<p>";
   print "First Name = $in{fname}<br>";
   print "Last Name = $in{lname}<br>";
   print "Email = $in{email}<br>";
   print "Phone = $in{phone}<br>";
   print "URL = $in{url}<br>";

   # open file handle and write to it
   # tab delimited text
   open(FOO,">>addresses.txt");
   print FOO
"$in{fname} $in{lname}\<BR>\<a
href=\"\mailto:$in{email}\"\>$in{email}\</a>\<BR>$in{phone}\<BR>\<a
href=\"\http://$in{url}\"\>$in{url}</a>\<BR>\n";

   close(FOO);
}
print "<a href=\"\http://jac.gsu.edu/cgi-bin/addressbook.pl\"\>Addressbook </
a>";
```

Importing Data Into an Access Database

MS Access is a very easy program to use, or at least it is fairly easy to get started with. Once one has to begin dealing with relational rather than flat file databases, things get a bit hairy. My goal here is not to teach you how to use Access but to convince you that it's not that hard to learn, and more importantly, that familiarity with it or something like it is critical for would-be technical communicators.

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3

Teaching Information Architecture: Technical Communication in a Postmodern Context

Michael J. Salvo
Purdue University

Information architects and technical communicators share some common interests and responsibilities. Practitioners of both fields of expertise wrestle with their connection to technology, and both groups claim multiple professional identities. Experts in information architecture have a range of titles, from information designer, to user-experience engineers, to interface specialists. Other groups, such as usability specialists and graphic designers, can often be categorized as information architects when working with the technologies of the World Wide Web. This makes the borders of information architecture porous, allowing openings for technical communicators to take on the functions and responsibilities of information architects. Both fields are related in their desire to participate in technological change, including an interest in influencing the way technologies shape the future. Brown and Duguid, in *The Social Life of Information* (2000), articulated this as aspiration "to participate in that shaping and not merely to be shaped" by technological change (p. 33).

Through the late 1900s and the turn of the millennium, *information architect* became an increasingly common title to describe a job that has been difficult to categorize and a challenge to describe. However, with the release of the second edition of their popular text, *Information Architecture for the World Wide Web*, Rosenfeld and Morville (2002) included technical writers among the professionals well suited to take on the role of information architect. Their text begins by defining the field in the language of a job description, highlighting the responsibilities of the information architect working on web-based information. They describe the deliverables, or the products an information architect is likely to produce.

Their list includes website blueprints, content maps and inventories, content models, controlled vocabularies (labeling systems or *metadata*), and design sketches (Rosenfeld & Morville, 2002, p. 15).

These professional documents are of great interest and relevance to web-based technical communicators because they define a new genre of documentation. They involve representations of information landscapes—each is a visual representation of virtual content, each in its own way a representation of an information space. Representing web-based information structures is a new role, and Rosenfeld and Morville discussed underlying political, institutional, and contextual elements involved in creating complex web-based information objects. They represented information architecture as the intersection of users, content, and context. I suggest that information architects can be understood as the kind of *postmodern technical communicators* recently called for in technical communication scholarship.

That is, in this chapter, I argue that the developing field of information architecture presents an opportunity for technical communication education. Bringing information architecture into the technical communication classroom can help technical communication faculty articulate how technical communicators can shape technology, while helping students understand how best to function as technical communicators. Technical communication work on the Web occurs in conditions that call for postmodern approaches as the best preparation, and I contend that teaching information architecture is the best avenue for preparing students in a way that is consistent with postmodern understandings of writing, communication, and culture. Cooper (1996) advanced a call for articulating a postmodern pedagogy of technical communication in her presentation at the annual meeting of the Council for Technical and Scientific Communication. This chapter builds on and extends that work, specifically focusing on conditions of web-based communication in the information age, and on ways that engaging in and teaching information architecture can fulfill Cooper's call. The chapter explores ways that rhetorically educated professional and technical writers can contribute to the development of online information structures, opening opportunities for engagement both with the design and creation of information objects such as large-scale websites and with the networks of discourse and technology that these websites support.

To accomplish this, the chapter first provides a rationale for technical communication instruction as postmodern. Next, it re-articulates Cooper's discussion of postmodern education as the basis for an action-oriented pedagogy. It then grounds these explorations of postmodern pedagogy with discussion of a web-based class of graduate technical communication students enrolled in an information architecture course designed to address the challenges of the postmodern condition of the information age. Finally, the chapter discusses opportunities for active engagement in the development of technoculture, particularly through web-based document systems.

WHY POSTMODERN TECHNICAL COMMUNICATION?

In 1996, Moore's "Instrumental Discourse Is as Humanistic as Rhetoric" appeared in the *Journal of Business and Technical Communication.* Designed to show how an "instrumental" (or, as others call it, "functionalist") rhetoric fits Miller's (1979) classic discussion of technical communication as humanistic, Moore's argument situated technical writing as a functionalist effort that is best when it is invisible, and that gives most when its very nature and production are in service to the information at hand. In the age of the World Wide Web and the demands of user-centered design, this definition can be understood as a fairly traditional approach to technical communication. According to the functional or instrumental rhetorical definition, a technical communicator "translates" technical material from the context of its production among scientists, engineers, and designers to the context of its use and application among users or consumers.

In their initial response to Moore, technical communication scholars Kreth, Miller, and Redish (1996) offered critiques of instrumental rhetoric. They argued that although instrumental rhetoric is a valid and existing rhetoric, and although it can indeed be seen as humanistic, technical communicators should not be satisfied with a limited role of translation. Rather than merely translating technical data between producer and consumer, the technical communicator can help the technology producer and consumer better understand both the technological artifact and the context of its use. The technical communicator does not just translate technical data from technology producers to consumers, but articulates how a technology can work, and communicates this understanding to users who might find the technology useful. In Brown and Duguid's (2002) terms, a functional definition of technical writing positions practitioners as passive observers, whereas the shapers of technology define the domain of technical writing.

The discussion of Moore's article raised an argument about the value of theory in technical communication education. But this discussion needs to move from a binary focus, to address how theoretical and practical elements of instruction can together inform the practice of technical communication. What *combination* of theory and practice prepares students for the complex workplaces students will enter? Students will rarely encounter situations in their professional lives that can be resolved neatly, as occurs in many generic scenarios presented in textbooks. Instead, education needs to present opportunities for students to practice their decision-making skills in messy conditions, which more closely resemble real-world situations. As valuable as textbook and web-based scenarios are to education, teachers have to remind themselves that these are scenarios or models, and are not the situations themselves—textbooks provide *simulations.* And there are limits to the usefulness of such packaged information commodities.

In 1995 and 1996, Johnson-Eilola (1996a, 1996b), Dombrowski (1995), and Cooper (1996) all argued that technical communication studies need to develop a critical rhetorical position in opposition to the instrumental/functional position offered by Moore. And they argued that an ethical practice that is consistent with postmodern rhetoric and the demands of digital literacy can enhance the contribution of technical communication studies in an age of growing access to digitally delivered information. I would point out that such a critical stance can position technical communication study as an important player in the continued development of technorhetorical inquiry. By offering the construction technorhetorical, I am invoking Latour's (1993) cultural studies work, in which he conjoined the technological and cultural to indicate the site where culture and technology become difficult to distinguish, the boundary that both divides and demonstrates interrelation. Whereas Latour merged technology with culture, technorhetorical inquiry invokes the porous boundary between technology and language, where the invention of a rhetorical strategy is difficult to distinguish from the process of technological invention. Technorhetorical criticism studies the boundary between Burke's definition of rhetoric as *symbolic* action and the design and creation of technological artifacts that *encode* that action. It is the boundary between symbol and artifact. The World Wide Web is the best contemporary example of such a cultural site, becoming a literal realization of both technorhetoric and technoculture.

Lyotard (1984) focused throughout *The Postmodern Condition* on the state of knowledge in an age of information. His text is preoccupied with questions of digitization and commodification of information. Lyotard argued that, however the term is defined, the central *social* question of postmodernism is "who will have access to the information these machines must have in storage to guarantee that the right decisions are made?" (Lyotard, 1984, p. 14). *Access* to information for those in positions to make decisions is the central question of postmodernity. The field of information architecture designs user-centered systems that foreground the importance of timely access. Those individuals who construct the information architecture of vast databases have much social power in an information age, becoming the gatekeepers of knowledge. Questions such as who is granted access to the system and why become political decisions. Equally important questions involve the decision-makers: Who are they, and why are they the legitimate candidates to create and access the databases?

The fact that this question is open—that who gets *legitimate access* does not yet have a clearly decided or widely accepted answer—defines the age as postmodern in Lyotard's analysis. Since Lyotard's *Postmodern Condition* was printed (1979 in French, 1984 in English), many have tried to offer acceptable answers to this question of authority. Lyotard called the question one of *legitimation*. And as discussion of legitimation in culture continues, it can be said that culture remains in a postmodern condition. We are in a postmodern age because matters of legitimacy are being discussed and perhaps redefined. Yet technical communicators may still wonder: Why does this cultural condition matter?

Postmodern moments are, according to Lyotard, "recurrent." They are moments in which culture addresses foundational ideas. The emergence of the information age, characterized in this collection of essays as the emergent technologies and cultural formations surrounding the World Wide Web, offers an opportunity to reexamine basic questions in culture. The relationship between experts and the general population, and particularly the relationship between producers and consumers of technology, are being renegotiated—the very terms of legitimacy of power/knowledge are being reformulated.

Information architecture can be understood, then, as a field of postmodern inquiry, and can inform the legitimating discourse of technical communication. Access to the database determines who gets to speak, as well as who has the authority of the data behind the words. Design of the database determines who gets access. Information architecture exists in the design of interfaces, databases, and websites, whether they are created for general or specialized access. Studying information architecture reveals the values of designers, whether or not the designers of the information object consciously enacted those values. Self-conscious awareness of information architecture becomes a component of technology design and documentation in a postmodern age because of the problem of legitimation. Thus, knowledge of and awareness of information architecture can become a component of technical communicators' legitimating discourse; such awareness can help define and assert an expertise that balances the competing discourses of humanism and functionalism.

COOPER'S ADVOCACY OF POSTMODERN RHETORICAL EDUCATION FOR TECHNICAL COMMUNICATION

In her presentation at the 1996 meeting of the Council for Programs in Technical and Scientific Communication (CPTSC), Cooper offered a reconfiguration of goals in educating technical communicators for the World Wide Web. In her reconfiguration, the move from predominantly print-based to digital practice of technical and professional communication offers an opportunity to reexamine naturalized practice with a critical eye: What considerations that are important in print-based practice will have less importance as digital media emerge? And what underemphasized aspects of communication reemerge as digital media multiply? Cooper advocated concentrating on four areas of emphasis in the education of technical communicators for the postmodern age, which are not new but have renewed importance for the age of online communication. These foci would broaden education in ways that could make technical communicators even more valuable contributors to communication on the Web, and more generally to the information age. They would help in the efforts aimed at making technical communication a stronger force in leading industry to ethical and socially responsible practices, if the field takes seriously the opportunity to re-imagine the roles played by professionals in technical and professional communication.

The four areas outlined by Cooper for the postmodern education of technical communicators, aimed at educating technical communicators for the information age, are as follows: contextualization, mapping, shared responsibility, and sustainability. Each of these categories makes it the responsibility of technical communicators to consider cultural, economic, ethical, and rhetorical factors, resulting in a different conception of efficient design and communication. Indeed, in Cooper's view, these rhetorical aspects of a technical communicator's education are as important as the ability to write effective documentation. That is, documentation requires more than attention to audience, but demands an understanding of cultural, political, and social contexts for effective and sustained use of technological artifacts by people.

Since Cooper's address, user-centered web design and usability practices have become more common elements in technical communication curricula and in information-based business environments, and these practices have become more sophisticated. Although programs in web and technology design strive to teach how to use the growing number of sophisticated digital design tools and how to conduct usability tests, not enough emphasis has been placed on *why* technical communicators should conduct or participate in usability tests, and *when* such testing is appropriate. It is valuable for our courses to teach skills and tools, but technical communication faculty need to take Cooper's advice and contextualize the use of tools.

For Cooper, contextualization allows the technical communicator to address issues of legitimacy. Contextualization articulates the justification for a particular agent to have authority in a particular situation. Contextualization also allows for a situational ethics, in which action can be justified according to the specific conditions present at the time of ethical decision making. Cooper's second item is mapping: the visual description of context. Whether involving a literal mapping of institutional power in a flowchart, or a more conceptual diagram of competing power relationships, mapping provides an opportunity to articulate trends and flows of power, and helps to locate any nexus of discourse where rhetorical intervention would be most effective. Third, Cooper described shared responsibility in the workplace as an element of postmodern technical communication instruction, and as an important component of any democratic system. Shared responsibility can be understood as recognition that with empowerment and freedom comes obligation. When authority is shifted from a top-down command structure to any one of a variety of models for distributed authority, agents have to accept responsibility for the consequences of distributed decision making. Democratic participation in the workplace is one goal of Cooper's postmodern technical communication instruction, which requires sharing consequences and responsibilities in addition to the benefits of authority. Finally, Cooper articulated a need for emphasis on sustainability in the postmodern education of technical communicators, which is narrowly understood as ecological sustainability but that can also be broadened to include economic and institutional sustainability.

Each of these four elements is important for the development of a postmodern pedagogy for technical communication. Although each element adds to the critical and methodological toolbox of technical communication, each remains theoretically driven. The elements need to be translated to address the needs of educational practice. These elements do not in themselves suggest specific pedagogical action, nor do they reveal how they are aligned with deliverable documents produced by technical communicators. From another angle, consider this question: How does a student represent awareness of sustainability in a professional portfolio? Or, at a more immediate level, how do instructors assign a contextual assignment?

In an effort to fill this gap, I describe five areas of application of Cooper's discussion: *audience awareness, user-centered perspective, systems view, ethics,* and *forecasting.* This discussion is designed to call attention to ways that Cooper's discussion can be applied in the technical communication classroom, while also presenting the value of information architecture as a field of inquiry within technical communication curricula. Components of information architecture can be offered as a class or curricular element in which theory and practice are in dialogue. I suggest that information architecture challenges both teachers and students to ask whether technical communicators understand their organizational placement and the roles they are expected to play. Technical communicators need to learn how to ask what is at stake for them, for their organizations, and for society when they move communication online. The components discussed address the postmodern education challenge posed by Cooper, but they should be rearticulated to meet the needs of each institutional setting.

Attention to Audience

Audience awareness, already an important element of rhetorical focus, contributes to contextualization in its demand to articulate readers' needs. Technical communication classes now apply rhetorical theory to inform the creation of effective texts. When applied to technological interfaces, a rhetorically informed process of designing websites seeks to comprehend and articulate the readers' needs in the writing process. User-centered design constitutes a rhetorical understanding of readers not as things but as people capable of being addressed and affected by a well-wrought presentation. Such reader-centered design strategies are already part of the process of usability testing. However, because different methods for usability studies are built on different values, yielding different results, a self-conscious postmodern technical communication praxis should involve study of these differences. Such study will help technical communication students understand how professionals establish their legitimacy within their institutional contexts.

Whereas contextualization demands that technical communicators develop an understanding of the rhetorical situation, and that they develop designs suitable for audiences, Cooper's address limited contextualization to an analytical tool used to gather information, applied by practitioners to understand themselves in relation to technology and institutions. Study of the values inherent in different methodologies will help technical communicators better understand themselves in relation to other professions, as well as in relation to the audience. It will help them fulfill ethical responsibilities. The curriculum should emphasize identification with the user, setting technical communicators apart from other groups involved in the technology and information design process. Identification with the reader will allow the technical rhetorician to speak for the reader during design. With such educational emphasis, the technical communicator will be better able to carry out the responsibility for accurately and persuasively representing the reader to engineers, programmers, and designers, as well as for accurately presenting documentation to readers.

User-Centered Perspective

Education in user-centered design and rhetoric provides important preparation for technical communicators to offer a user-centered perspective in the technology design process. As a result, technical communicators will be well prepared both to articulate to resistant programmers, designers, and information technologists the reasons for including users in the design process, as well as to collect useful information *from the audience*: the users. Technical communicators will thus be prepared to contribute substantially to the development of information architecture.

Usability pioneers, such as Norman (1990) and others, advocated not just testing a design late in the product development cycle, but developing a commitment to a user-centered design methodology. Johnson's (1998) discussion of such a user-centered design approach demonstrates the value of incorporating usability testing throughout the process of technological development. Bringing audience awareness and usability testing together contextualizes the goals of technological development, foregrounding the importance of the cultural and social context for the design and adoption of new technologies.

However, only by understanding the current trends and flows of technological use, as well as past successes and failures, can the technical communicator effectively design interfaces and technological solutions for use. Technical communicators should be taught more than just usability testing. They should learn to consider technologies that have already been successfully adopted for use, in order to understand how new technological artifacts may help or frustrate users. They should learn to address questions such as the following: How well can the technology fit into existing behavioral patterns? And how much work does the user need to do to effectively use the new device or information? Some technologies are so powerful that people accept their disruptive introduction into their lives. However, most artifacts do not have such far-reaching effects. Developing user-centered design practices, incorporating audience awareness, integrating usability testing, developing historical awareness, and understanding cultural constraint and social need should all help technical communicators build interfaces that are both easily learned and productive for users.

Systems View

Sullivan and Porter (1997) developed mapping as a central metaphor for technical communication research practice, asserting an active, self-conscious role for technical communicators both in their organizations and more broadly in culture. Mapping represents complex relationships, for instance, through building systems views of organizations, information products, and technological designs in order to represent different influences on the technical communicator, the context of communication, and on the organization of which the technical communicator is part. Mapping requires development of a systems-level view of both the processes of information design and the communication patterns of the specific organization. Through learning to map these processes, technical communicators can teach disparate elements of an organization to work together to achieve the design of the information space. Developing such a systems view is an important element of postmodern pedagogy, as described in Wilson (2001).

Maps can help users see how their work contributes to the larger efforts of the organization, thereby offering a systems view for effective comprehension of the goals of an organization. However, students need to learn critical analysis of mapping. Johnson-Eilola (1996b) illustrated the rhetorical nature of maps in which the selection of certain information to display can obscure other information.

The postmodern technical communicator should learn to use mapping for articulating the roles that different elements of an organization play in the design and development of technologies, as well as for locating where linking related efforts will help toward faster project completion while avoiding duplication of effort. Because information architecture looks at the interaction of disparate and sometimes physically separated elements of an organization to create usable information structures, study of information architecture can help the technical communicator conduct the project of mapping.

Ethics

Ethics is already taught in a number of different ways in the technical communication curriculum. Arguments over the single most effective place or way to teach ethics ignore differences in students' learning styles, and assert global solutions where local and situated practices are more appropriate. Instead, introducing information architecture to the technical communication curriculum extends the opportunity for students to enhance their potential ethical contributions to an organization. Technical communicators could then participate in information architecture development, focusing attention on the valuable role of communicating with users and on the important role that users should play in technology design, as well as on how the organization interacts with the outside world. Likewise, with knowledge of information architecture practice, technical communicators can open the process of technological and information design to democratic participation, offering an opportunity to explore alternative models for industrial and technological development.

Forecasting

Coupled with a concern for environmental rhetoric, technical communicators also have an ethical responsibility to examine the medium- and long-term effects of a technology or technological process on both the natural and institutional ecology. Different processes will affect the natural environment in different ways, and technical communicators have an ethical responsibility to make sure any dangers to this environment are documented and communicated to designers, programmers, and management—and to follow through to make sure that solutions are developed. But technical communicators also have a responsibility for the institutional ecology: maintaining the long-term communication patterns in the organization, as well as making sure that experts are heard and respected in their fields of expertise. Communication sustainability influences institutional morale as well as public relations and ecological responsibility. The technical communication curriculum should prepare its degree program students for addressing such issues.

Although some corporate entities will balk at the idea of streamlining the delivery of information to their critics, doing so will make business decisions that much more transparent, an important consideration after the post-dot-com-bubble investment market collapse and in the wake of accounting scandals of 2001–2002. Some forward-looking institutions might welcome the positive public relations potential of making such information available.

Educational preparation for understanding technologies in a cultural context and from a user-centered perspective will provide background for technical communicators to make reasonable predictions about the viability of technological forecasting. No future is guaranteed, but if technical communicators understand past attempts at technological innovation and their unraveling, then they will be better positioned to suggest designs with greater chances of success. Understanding the history of unintended consequences from technological change may not make it possible to avoid unintended consequences (which is, after all, why they are unintended), but an ability to forecast does remind innovators to look for and minimize the damage of unintended effects. Any attempt at forecasting is only as good as the model of the world used to generate the forecast. Therefore, it is important to remind practitioners, colleagues, and students that forecasts and expectations are what they are: limited sets of anticipation based on prior experience—limited in value, but rich in persuasive power. And it is important to offer curricular attention to historical technological changes and their cultural contents, to best prepare technical communicators for such forecasting responsibilities.

Information ecologies, as described by Nardi and O'Day (1999), are important to consider. However, the methodology of analysis described by Nardi and O'Day falls short of supporting action necessary to forecast effectively. I elaborate on ways to move from analysis to action later, following a discussion of a technical communication course on information architecture.

TEACHING INFORMATION ARCHITECTURE

In the age of the World Wide Web, as already discussed, postmodern technical communication education needs to reflect ethical and cultural dimensions of working with and developing technology in complex workplaces. A steady focus on why and when to act rhetorically would focus technical communication education on humanistic practice rather than maintaining the focus on how-to training. To offer a concrete sense of how a course in information architecture can promote such a postmodern educational focus, I describe a course I taught to technical communication graduate students at Northeastern University.

Students were asked to complete three assignments during the course. The first was a description of the design of an existing information object. Second, students mapped a space or place whose primary purpose was dissemination of information. Finally, students created an information solution to a technical problem. Each of these assignments asked students to apply rhetoric to information objects. The course was designed with Cooper's four elements for educating postmodern technical communicators in mind: contextualization, mapping, shared responsibility, and sustainability.

The object description required students to investigate the physical design of an object intended to provide access to information. Students looked for evidence of design decisions made within economic and contextual constraints. Students were asked to look into the limits of designing for users and to read Norman's *The Design of Everyday Things* (1990), which distinguished between two different kinds of maps: conceptual maps and literal device maps. Norman offered language for students to begin assessing design in the context of use and from the user's perspective, while encouraging students to articulate their own experience with devices, narratives that revealed a variety of ways in which technology design can fail.

Students began to analyze both the design presented through the technology and the documentation accompanying different artifacts, developing language for studying both the design as presented through the object and the context of the object's use. Such study led to more informed discussion of how and where design was successful, and how, where, and why the design failed. It also provided opportunities to assess where users are likely to blame themselves for design failure, which Norman articulated as a major problem in design. Many discussions emerged as students saw themselves not as the source of technological failure, but as the unwitting victims of poor design. As one student wrote:

> Finally! When I can't operate something that is "simple" or that even an "idiot" could figure out, I don't have to throw it against the wall or walk away in disgust! I have lost track of all of the times where I contributed to Norman's concept of "Falsely Blaming Yourself" (34). I'm not making an excuse for every device that has malfunctioned in my life (I'm sure plenty of them have been my fault), but there are some things out there that we use every day that just don't work properly due to poor design.

When students saw that it was the design that was failing them, rather than a deficiency in themselves that caused the design to fail, students began to redesign objects they had already incorporated into their lives. In this one case, a simple addition of color worked to help a student reach into the correct pocket of a new briefcase, and allowed the student to use the case effectively:

> I can not agree with you more. About a month ago I purchased a case for my laptop, which has three zippers! Every time I go to take something out of one of the zippers, guess what, I always open the wrong one. Now I know that this is not my fault but it is in the design. If I only read this book a month ago, I would have never purchased this case. I now tie different color strings to each zipper and associate the color to the objects that are inside.

The intervention the student describes—tying colored string to the zipper tabs—is modest, but demonstrates the re-articulation made possible through analyzing and criticizing design. These students began to see technologies through users' eyes, and became better able to articulate users' needs—through articulating their own needs.

The process of creating conceptual maps required students to imagine how the device worked, while physical maps represented the interface of cell phones, clock radios, and other common technological devices. Students also contextualized their use of these items, becoming aware of the ways in which the devices failed because of constraints or limitations in their design.

Moving from modest individual artifacts (e.g., an information device) to information spaces, students were asked to move from describing individual objects to address the interplay of different objects in space. The second assignment required students to find and map information spaces for the class. In describing physical information spaces (including museums, transportation hubs, libraries, offices, shopping malls, etc.), students were expanding their abilities to describe existing information architecture. This assignment asked students to map literal architecture and its effects on the flow of information. Pedagogically, class instruction and online discussion moved from the individual artifact to the design of context: Students described how an individual works within a complex network of technologies to find various bits of information necessary to build solutions for a complex task or a series of tasks. One student articulated her experience as she began to see constructed spaces differently:

> I just recently visited a friend who had a baby. As I got off the elevator, I headed toward the maternity ward and my second thought was (my first thought how dirty the place looked but that is another story) how horrible this place was designed. It wasn't geared toward the patients, visitors, or even the babies. So as I waited outside my friends' room I was visualizing how the ward should be designed.

Rather than seeing space in purely aesthetic terms, students revealed that they were beginning to see these constructed spaces as supporting or hindering interaction. This student was not alone in developing a user-centered designer's sense of the human-constructed world. Students became aware of the shared responsibility represented in the design of these spaces. Some offices divided groups that were required to work closely together, resulting in physical support for psychological distance and workplace dissonance, whereas others found designs and floor plans that supported effective interaction between groups of people.

Discussion in the class at this point centered around the text *Information Design* edited by Robert Jacobson (1999). Some chapters in this collection (Whitehouse, Screven, Passini and Holtzman, especially) describe a complex relation among the different elements of design: the designer, the user, the space housing the artifacts, the information artifacts used, and the interfaces of those artifacts to map design. These authors described complex relations binding objects, technologies, individuals, and knowledge together. As such, information objects and spaces can be analyzed for the human relationships they support and those they complicate or even prevent, revealing relative power positions. Analyzing technologies in their context of use reveals how technocultural space becomes discursive space. Students contextualized their maps with their observations within these information spaces.

In order to move the students from analysis and critique of existing spaces to architecting their own spaces, the final assignment asked students to locate an organization in need of an original information object, or to locate an existing virtual object that was poorly designed or that impeded information sharing. Students generally chose web-based information structures, although a few selected more complex situations in which digital technologies interacted with physical spaces. Indeed, web-based projects have physical extensions into users' contexts of use, but students often chose to stop at the border of the screen. In each case, students were designing not merely "for the web," but were instead considering larger networks of influence on communication. Students were facing cultural, technological, contextual, and linguistic constraints on the design and implementation of information architectures. As such, these students considered issues of contextualization, mapping, and shared responsibility.

As students discussed their final projects, they revealed concern for audience as well as sophisticated ways of dealing with the ambiguities of designing digital information spaces. Students often discussed new media in terms of their expectations for older media, as these two students explored issues of audience for web-based intranets:

> A hard thing for me to get my brain around is the audience. Not only is it extremely vast, but has different purposes. With my online help and printed manuals, at least I can say that all of my users need to learn how to complete x, y, and z. With a virtual space (mine being an intranet), some of my users might want to learn benefit information, some might be looking up another employee, and another might want to see what the cafeteria is serving for lunch. In other words, the endless possibility purposes really puts me on shaky ground, and I'm *very* uncomfortable with it.

A student responded to concerns of audience and design intention:

> Initially I had the same thought. I'm doing an [intranet] too. But I then took a broader perspective . . . such as, users visit to seek specific information, to gain general understanding or to browse possibilities. For my site this approach seemed to work well in the contact of my site although it's still hard to limit possibilities while also allowing for them.

The response from the second student indicates a complex understanding of the audience for the information object. In the case of this intranet, the users were fellow employees and so the student had easy informal access to users. After doing some research with both the designers and the users (the student's coworkers), this student discovered that, although there were numerous possibilities for the use of the site, there were discernable and identifiable trends for which she could design. The student also articulated a recognition of and level of tolerance for ambiguity (to limit proliferation of possibilities while also allowing for them). In the future, the student may develop other navigation strategies for other users, but will keep design tuned to users' needs. By studying information architecture, students were preparing to understand both the rationale and ethics behind effective usability testing, looking beyond the mechanics of "how to do" a usability test, toward experimentation with iterative, contextual, and user-participatory design strategy.

Online student discussion revolved around the twin centers of the definition of information architecture and the definition of technical communication. Not satisfied with coding pages or translating information for different audiences, students began to discuss the implications of designing information and information spaces on the meaning, interpretation, and significance of that information. In discussing information architecture, students began to ask what it means to communicate and what it means to design, and through those discussions, began to interrogate their assumptions about their future profession as technical communicators. They began to ask complex and interesting questions, to see themselves as part of a system, as well as a context, of communication. They began to see possibilities within their working circumstances to act to improve users' interaction with information. Through their expanding loci of concerns in their online discussion, student attention to contextual issues of culture, communication, and technological issues—rhetorical issues—became evident. Here, a student explored the politics of information architecture:

> I think politics are an issue in any profession and not just information architecture. Dealing with personal egos, business organizations and historical politics in a company are often hard to solve (or even get around) without further stepping on toes and creating a whole new problem. In general [it's] usually best to gather everyone together and just talk out what the actual concerns are and what needs to be done to move forward. Sometimes you'll find people just do not understand what you are proposing and are not supporting [your plans] because they think it'll mean some change or work for them. It's not easy. Also, it helps to have an ally for those who are deeply entrenched in their own perspectives and not "open" to discussion.

This student articulated a rhetorical problem: the way one creates support for plans that impact powerful concerns within the organization, perhaps displacing some and creating additional work and responsibility for others. The author also demonstrated an interest in creating dialogue in order to communicate with institutional stakeholders. The message recognizes that power ebbs and flows within the organization, disclosing the need for allies within the institution. Although no definitive conclusions were reached regarding either technical communication's place in an age of information or the role of rhetoricians in information architecture, studying information architecture allowed these technical communication students to enact rhetorical analyses of technology and to understand their roles in the context of the politics, technology, and culture of their institutions. Students were able to prepare for professional action and to practice strategies for intervention; they were learning to recognize opportunities to engage in user-centered technological design.

INFORMATION ARCHITECTURE: FROM ANALYSIS TO ACTION

The World Wide Web has opened a Pandora's box of problems and potentials for technical communication. From one perspective, the Web is simply another medium to present technical information. Yet, simultaneously, shifting from paper-based to web-based practice not only presents the field with a challenge to understand and effectively utilize digital technologies, but offers opportunities to reconceptualize the meaning and teaching of technical communication.

The World Wide Web is now a 10-year-old technology, and it is remade with each new application: First, the browser changed the way digital information was integrated on the screen, then peer-to-peer technologies such as music file sharing changed the relationships between users. Instant messaging and video conferencing change the way users think about and utilize e-mail technologies. In addition, cell phones, ever-shrinking digital assistants, and multifunction devices all promise (or threaten) to put an office in one's pocket. These technologies require the expertise of information architects capable of leading teams that will build structures designed to make vast amounts of information navigable. No one person will be able to do the work him- or herself, just as no one field's expertise will be able to meet every technological and communication challenge. Although many players will participate in the creation of information architecture, there are compelling reasons for technical communicators to learn how to address rhetorical issues of information architecture.

It is important here to distinguish the specific professional job title of information architect from the political, social, institutional, and cultural contexts of the web-based design and representation of information, or what this chapter describes as information architecture. In this definition, information architecture becomes a title for a field of inquiry that has been difficult to describe. Nardi and O'Day (1999) introduced a competing title and definition: "Information Ecology is a system of people, practices, values and technologies in a particular local context." And, as influential as Nardi and O'Day's construction of *information ecologies* has been in contextual studies of information and technology, information architecture is distinct from information ecology. Nardi and O'Day offered an analytic tool for studying existing relationships among "people, practices, values and technology," whereas information architecture actively *constructs* these relationships.

In 1996, Johnson-Eilola (1996a, 1996b) described what technical communicators should do in the postmodern age. Building on Reich's articulation of *symbolic-analytic workers* in *The Work of Nations* (1992), Johnson-Eilola (1996a, 1996b) pointed to the needed focus in technical communication curricula on mapping, as opposed to authoring. Symbolic analytic workers of postindustrial society are distinguished from industrial workers by the fact that they manipulate information. The "new work" is often the creation of information from raw data, requiring mapping. Johnson-Eilola emphasized that technical communication requires an advanced level of symbolic-analytic interpretation. I argue that information architecture goes beyond interpretation of existing relationships, and information architecture can help technical communicators develop abilities to work effectively in the new spatial conditions of the Web, by repositioning them to function as mapmakers rather than as authors. This seems a productive way of preparing students for symbolic-analytic roles in the environment of the World Wide Web. Whenever an information architect defines search terms through the creation of a controlled thesaurus, creates the conceptual map of the hypertext navigation structure, or presents a blueprint of a large-scale website, the work creates relations among and between what had been discrete bits of information. This kind of work is symbolic-analytic work. And whether an information architect, technical communicator, or someone with another title does the work, it goes beyond describing existing relations among and between bits of data, but involves creation of relations.

The work of the information architect can be narrowly defined as organizing, categorizing, and labeling information for effective storage, search, and retrieval. Technical communicators should be educated to move beyond this narrow definition, by close attention to contextual understanding of information, interface design, and spatial mapping structures. Rather than assert that technical communicators should become information architects, this chapter suggests that aspects of information architecture can help technical communicators better define their rhetorical and professional roles in the age of the World Wide Web.

CONCLUSIONS

Some distrust the goals of a sophisticated postmodern rhetorical education, fearing that programs promising technical expertise will then deliver academic theories and idealism incompatible with workplace realities. Whereas hierarchical control and top-down communication strategies are the reality in many workplaces, much of the Web thrives among flattened hierarchical structures. Should web-based praxis simply succumb to traditional business pressure? On the one hand, user input and worker controls are hallmarks of web-based communication. Yet the bigger challenge remains—to balance the education of technical communication students so that they are employable and yet also become engaged, educated citizens capable of articulating both the ways that technology and culture intersect, and new ways in which they would like technology and culture to develop.

At stake in the discussion is the contrast between educating and training technical communicators. As communication moves online, information architecture provides an opportunity for a critical rhetorical education for technical communicators. Cooper articulated analytical goals for postmodern technical communicators. This chapter applied these analytical goals to five areas of expert action—audience awareness, user-centered perspective, systems view, ethics, and forecasting—showing ways that the field of information architecture provides an opportunity for educating technical and professional communication students for a lifetime of work in a rapidly changing and developing field. With such an education, these students will have the analytical skills and ethical self-consciousness to consider consequences of their actions, engaging in discussions not just about what can technically be done, but about whether some things ought to be done. Whereas the proliferation of web-based communication offers short-term opportunities for trained technicians, long-term opportunities continue to open to broadly educated technical rhetoricians. Recognizing and extending these opportunities, whether in information architecture or elsewhere on the Web, requires the kind of contextual understanding that a sophisticated postmodern rhetorical education offers.

In the age of the World Wide Web, education needs to change to better prepare technical and professional communicators to participate in the ethical and cultural effects of working with and developing technology in complex workplaces. A steady focus on why and when to act rhetorically would focus education on humanistic practice rather than maintaining the focus on how-to training. Technical and professional communication researchers have articulated a set of strategies for educating the "postmodern" technical communicator. Such education must be concerned with contextualized rhetorical practice, the development of a critical analytical perspective, and the ability to rhetorically intervene in the technological and cultural development both of artifacts and organizations. I here contend that an information architecture course within a technical communication curriculum can provide an environment where students can experiment with and apply their newly developed analytical skills while developing a sense of when and how to intervene in technoculture.

The prominence of the Web has opened new opportunities in managing technology development, from interface design to user experience to content development. Technical communicators are, in many ways, prepared to act as experts in the management of complex information spaces such as large-scale websites. Technical and professional communicators are well positioned to contribute to the development of information architecture. Such technical rhetoricians bring perspective, training, and practices that are potentially valuable, yet not currently part of the education of information architects. Introducing information architecture into the technical communication curriculum enhances the ability to strengthen the analytical, ethical, and critical education of technical rhetoricians, and to appropriately educate "postmodern" technical communicators. The need for professionals who understand the design and use of technologies from a user's perspective is increasing rather than decreasing, so technical communicators need to be educated in the practices of information architecture and the associated strategies of user-centered design. Technical communicators can reap significant benefits by including information architecture as a component of their education in the age of the Web.

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Rhetoric and Information Architecture as Pedagogical Frameworks for Website Design

Lee Honeycutt
Iowa State University

Karen McGrane
Razorfish, Inc., New York

Most of us who work in technical communication programs realize the value of teaching website design using a rhetorical approach (Hunt, 1996; Jackson, 2000; Swenson, Constantinides, & Gurak, 2002; Tovey, 1998). We know how sensitivity to audience and attention to construction of digital ethos can help our students overcome many of the problems we see on countless sites littering the web. At the same time, there seems to be a practical discrepancy between a rhetorical approach to website design advocated by many academics and the design techniques employed by professionals in many digital design studios. In his critique of technical communication education, Moore (1997) argued that the rhetorical approach of most university programs is inappropriate for teaching many forms of workplace communication; instead, he advocated a task-oriented "instrumental" approach that displaces persuasion as the primary goal and instead concentrates on showing users how to perform certain actions. Additionally, Moore believed such an approach can aid technical communicators in their management of various project components, including both technology and personnel.

Although Moore did not specifically target web design pedagogy, his critique pointed out the limitation of purely persuasive rhetorical approaches when applied to newer forms of communication. And, as most site designers can attest, the web presents new challenges in how communication is achieved with targeted audiences. This is one reason that information architecture has become an important design philosophy for many professional website developers (Rosenfeld & Morville, 2002). During the web's infancy, traditional rhetorical approaches, which focused mainly on audience persuasion and construction of ethos, seemed to make a great deal of sense in the construction of a main page and a few secondary or tertiary pages. But as websites mushroomed in scope and content, the persuasive approach seemed somehow inadequate to the complex task of helping broad and specific audiences find their way through voluminous amounts of online information.

The organizational principles of information architecture are now deemed crucial for understanding how to design and update professional websites. With its emphasis on information structure and navigation systems, information architecture fills a void created when persuasive rhetorical approaches met the new medium of the web, although rhetoric and information architecture share a number of common features and goals. However, the nomenclatures of these two systems are vastly different, creating potential problems for rhetorically trained students when they enter the web design workforce. Digital design studios in major metropolitan areas around the globe simply do not turn to Aristotle when constructing a site, although we argue they often employ the interrelated concepts of *logos*, *pathos*, and *ethos* even if they call them something else. In order to rectify this problem, technical communication instructors teaching website design need to be familiar with concepts and terminology in both design philosophies if they are to adequately prepare students for work in professional design firms.

In this chapter, we compare and contrast these two approaches to website design, showing how the strengths of each often address the weaknesses of the other. Persuasive rhetorical approaches themselves are not obsolete, but merely incomplete when faced with modern design problems. As Kaufer and Butler (1996) pointed out, the traditional categorization of rhetoric as a practical art is a primary reason why rhetoric has so often devolved into static rules and formulas for production. Instead, they suggested reconceptualizing rhetoric as a design art in which "the interplay of diverse elements . . . mediate intention and artifact" (p. 36). If rhetoric is to indeed reemerge as a modern design art, then it must be able to serve as an architectonic framework for the design of new media products such as World Wide Web sites. But for good or bad, that role is now being filled by other design frameworks.

To clarify some of the differences between these two approaches, we first of all define each perspective and describe some of its main features. We then analyze two websites[1] from each perspective to show how each can help guide the design of various site elements:

- **Sun Microsystems**—a primary hardware and software company that has developed network solutions for more than 18 years.

[1]The site iterations analyzed here are not the current version of the companies' websites, which have been either updated or redesigned since our analysis. Although the analyzed sites no longer exist, their designs are excellent examples of the points we wish to make. Readers wanting to access active versions of the analyzed sites are invited to visit *The Wayback Machine*, an extensive collection of archived web pages available at http://www.archive.org.

- **Firestone**—a major tire manufacturer prominently featured in the news in 2000 because of tire defects and subsequent recalls.

Following our analysis, we discuss important areas where the two design philosophies overlap conceptually, but differ in terminology. Such conflicting nomenclature can cause confusion in communication between practitioners in academia and industry, especially because web design is attracting an increasingly multidisciplinary workforce that may not be as familiar with rhetorical concepts as those graduating from technical communication programs. In response to the limits of persuasive rhetoric, we also reconceptualize web rhetoric as a systemic guide in decision making for both designers as they construct large-scale sites and for users as they navigate these sites. We then conclude the chapter with pedagogical suggestions for web design instructors and a discussion of future trends that may alter the way all of us teach website design.

THE RHETORICAL APPROACH

In teaching website design using a persuasive rhetorical approach, technical communication instructors often focus on the long-standing relation between information, audience, and author credibility—*logos*, *pathos*, and *ethos*. As our students obtain technical skills for communicating via the web, they still need to learn the importance of designing websites that appeal to target audiences and help establish the credibility of the organization or company sponsoring the site. Of course, many rhetorical principles regarding the writing of print documents still apply to writing within individual nodes of a website, but as Nielsen (1999) pointed out, some textual elements need specific adaptation to technologies of the web. But regardless of delivery medium, technical communicators still need to know how to fashion coherent texts that meet the information needs of designated audiences.

Hunt (1996), for example, discussed the various ways in which technical communicators can establish ethos within cyberspace by situating an organization's values within a specific social context on the web. As he pointed out, the web is different from other media "because technologically it provides the ability to forge connections with a diverse collection of information sources at multiple and diverse locations" (p. 382). Drawing on Halloran's (1982) point that a fundamental meaning of ethos in the Greek lexicon is "habitual gathering place," Hunt suggested that technical communicators construct a *communal* ethos that taps into the Internet's founding atmosphere of interactivity and information sharing. Coney and Steehouder (2000) called audience relationship the web's essential rhetorical nature and argued it is the least understood element of site design. To help technical communicators better understand and manage audience relationships, they provided a detailed set of role-playing heuristics designed to flesh out characteristics of both actual and evoked audiences, and to help shape the online persona of authors.

Yet on a deeper level, Hunt (1996) believed traditional notions of ethos are often undermined on the web when a site presents an inconsistent look and feel or exhibits an illogical information structure. Tovey (1998) also discussed the importance of organizational structure in developing hypertext, including it among other rhetorical elements such as audience and purpose, and Jackson (2000) stressed that organizational structure is a primary component in the rhetoric of website design. Yet within the rhetorical canon of arrangement, which has traditionally been applied to composition of linear speeches and written documents, there is little that can prepare one for structuring large-scale websites. It is on the single print document or individual web page that rhetoric seems to have had its greatest impact, both textually and visually.

Rhetoric has a long history of teaching its lessons through analysis of examples, both good and bad, and the web is no exception. But because the web is strewn with countless examples of bad design, some instructors tend to focus their students' attention on such sites as models of what not to do when constructing their own sites. Indeed, students can learn much from a poorly designed website and how companies facing a crisis of confidence fail to take advantage of the web to maintain ethos with their customers and the public. But the best models for rhetorical approaches to web design are successful sites, which are rarely used as models because their successful blending of rhetorical elements into a unified product is often transparent and thus harder to analyze. In our rhetorical analyses, we provide both types of examples. The primary focus is on homepage imagery and textual content, but in some instances we do reference some pages and elements at secondary or tertiary levels.

Sun Microsystems

In terms of digital ethos, perhaps no other company has more successfully utilized the web from its very inception than Sun Microsystems. Known for its quality products and technical innovation, Sun has firmly established its ethos with key players in the information technology sector, including software developers and system administrators. Despite this reputation, however, Sun must constantly contend with both the open-source Linux operating system and archrival Microsoft for market share of the network solutions business. In the fast-paced world of the Internet, ethos is much like a garden that needs constant tending to prevent competitive weeds from taking over. Sponsor of some of the web's earliest portal sites, Sun has consistently used the web to generate good will among those technologists developing Internet-based applications and networks. For example, web design guru Jakob Nielsen conducted his first web usability studies while working at Sun, and used the company's site to publish his results before leaving to form his own company. And Sun continues to effectively use the web to sustain its reputation.

But even if you were ignorant of the company's reputation, a visit to its website would soon educate you. As Fig. 4.1 shows, the company's main page in the year 2000 was well designed with appealing visual imagery of people using technology to achieve their work goals. The page's primary image of a woman working intently at her computer while bathed in the monitor's soft glow denotes a feeling of industrious serenity. The image is not a constant, however, and was used only one week to promote the company's Web Learning Center. In fact, this choice location was reserved for rotating feature images that promote articles about various company programs. Below this feature image are six static visuals corresponding to main divisions of the site, including everything from tutorials and product information to company history and consulting information. But the company has also

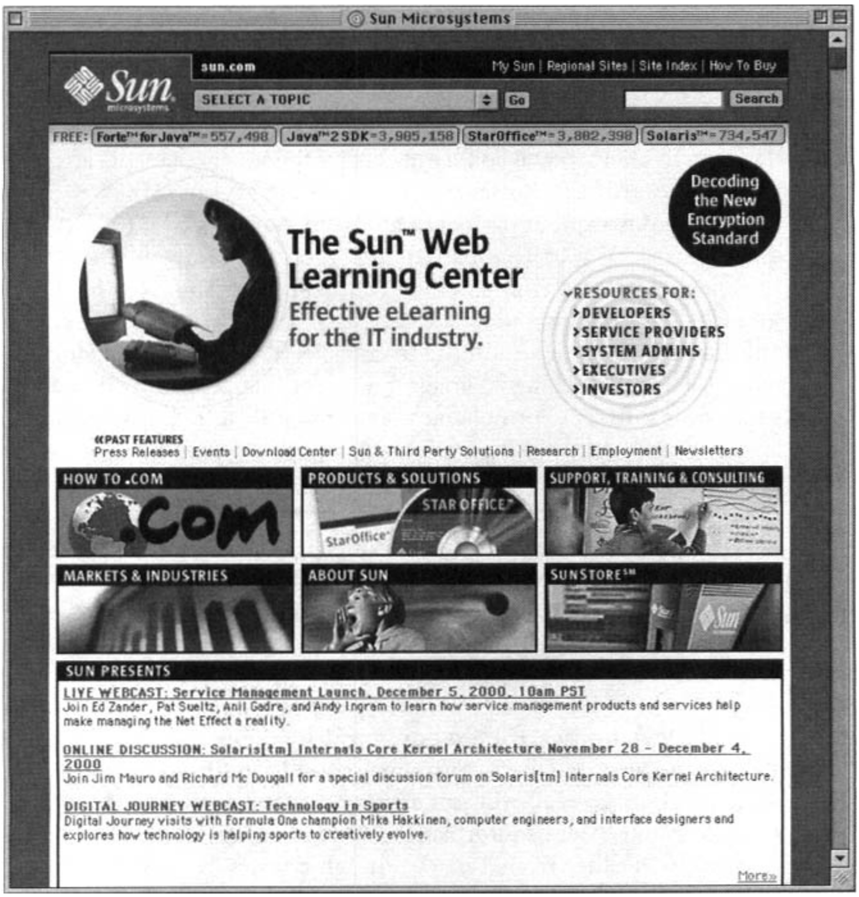

FIG. 4.1. Sun Microsystems' website.

segmented much of its product information according to what it believes are its primary audiences—developers, service providers, system administrators, executives, and investors—in other words, the sophisticated top end of the information technology sector. Such audience-based menus have become a common feature on corporate websites in the past few years, allowing customers to find information tailored to their specific needs. But perhaps the site's most important feature in terms of maintaining digital ethos is the presentation area near the bottom of the page. Here, the company advertises a continually updated schedule of live webcasts and online synchronous discussions that help the company build communal ethos.

Firestone

One might expect an organization with a preexisting reputation in the computer industry to use the web effectively. A more stringent test for constructing digital ethos occurs when an organization is faced with a public controversy that threatens its reputation. Such was the case with Firestone Corporation, which in fall 2000 was mired in a product defect controversy that threatened the company's financial future. In many ways it could not control the swarm of media attention surrounding the controversy; however, Firestone could have used the web as one way to handle customer questions, comments, and concerns about disintegrating automobile tires. Yet, as Fig. 4.2 demonstrates, the company did little to change its fundamental web ethos once the controversy began. In all three iterations of the site, the company and its site designers clung to a visual image of unbridled mechanical speed that did little to console drivers worried about their family's safety. The slightly blurred image did in fact change with each iteration, but only to show a different Formula race car at a slightly different angle. In Fig. 4.2-B, the company's linked 100th anniversary logo is replaced by a linked cartoon figure of a tire and the phrase "Be Tire Smart, Do Your Part," which takes readers to tire safety information. In Fig. 4.2-A, underlying pages about the company's tire recall efforts are accessed through a single link in the white text box directly above the background image. In Fig. 4.2-B, these pages are accessed through three separate links moved to the top center of the page, while management changes at the company are announced through a single yellow link below the car image. In Fig. 4.2-C, with the controversy having damaged the company's bottom line, the new management responds by covering the featured image with a prominent, transparent text box in which the new CEO apologizes for the tire defects and vows to regain consumers' confidence. This statement is accompanied by links to basically the same underlying pages about the tire recall effort, where consumers access information about affected tire models, replacement programs, and other related news through a series of "frequently asked question" links in a pop-up JavaScript menu. There is serious tone of urgency in the CEO's apology, as if the company is desperate to change its image; yet, the

2-A - September 2000 **2-B - November 2000** **2-C - December 2000**

FIG. 4.2. Iterations of Bridgestone/Firestone website.

background image persists and the content and structure of underlying pages have changed little. If Firestone had had the technical savvy and know-how, it could have created a much more interactive site to address the concerns of its customers. The company may have been unable to establish true communal ethos amidst such a firestorm of publicity, but a more interactive site laden with timely and accurate information of real use to consumers could have done much to defuse some of the controversy.

Although business leaders and economists may argue for decades about how Firestone should have responded to this controversy, it is safe to say the company failed to adequately use the web as a way to inform customers about the problem and to help repair an ethos damaged by the spotlight of sustained national media coverage. In its short history, the web has become a medium to which people often turn for supplemental information omitted from the shallow coverage of broadcast journalism. Somehow Firestone seemed to be ignorant of this fact. The company had more than just a simple public relations problem on its hands, but it could have managed and contained the controversy to its own advantage had it made better use of its website. Instead, consumers were greeted at the site by inappropriate imagery and a mishmash of poorly designed information that did little to convey confidence in the company and its products.

Visual Rhetorics

Of course, modern rhetorical theory has more to offer web design than the three classical modes of persuasion, which are a by-product of strictly Aristotelian views that many feel have passed their course. Some recent scholarship in technical communication has sought to adapt the basic principles of traditional rhetoric to the increasing use of visual elements in print and electronic documents (Dorman, 2000; Kostelnick, 1996; Kostelnick & Roberts, 1998; McNair, 1996). Kostelnick and Roberts (1998), for example, did much to show how rhetoric can be applied to document design through increased attention to layout and visual consistency across the entire document. Similarly, Schriver (1997) showed how concepts from the rhetorical tradition are often used by graphic designers to teach students the public importance of visual elements in document design:

> Design teachers who advocate a rhetorical approach encourage students to recognize that the visual structure of information must serve the needs of the intended audience. This emphasis during planning and invention helps students to understand the public nature of design. They learn that personal intuition, while essential, is not enough. They learn that an effective design must do more than please the designer. It must first of all meet the needs of the audience. (p. 59)

There is much in these rhetorical/visual approaches to document design that can be applied to the composition of individual web pages; however, this approach offers little to designers of full-scale sites other than the importance of focusing on audience needs and maintaining consistent look and feel across pages of the entire site. This is not meant to condemn efforts to apply rhetoric to the production of digital media, but we do want to suggest that more precise and articulate frameworks for the production of websites are emerging within design circles where practitioners have little clue as to who Aristotle is. As a result, we believe it is fruitful to compare concepts from traditional rhetoric to those of information architecture to see what elements of each design philosophy are most practical for teaching website design. To do so, we first of all describe some of the primary concepts of information architecture and then reanalyze the Sun and Firestone websites using this approach to show how the two differ in the composition of larger sites.

INFORMATION ARCHITECTURE

First popularized by Wurman (1997), information architecture has quickly blossomed into a specialized field that concentrates on the structure and organization of large-scale websites and other hypertextual media. A closely related field is *information design*, which has almost as many definitions as rhetoric itself, but is perhaps best defined by Jacobson (1999) as "the systematic arrangement and use of communication carriers, channels, and tokens to increase the understanding of those participating in a specific conversation or discourse" (p. 4). As Jacobson explained, the field of information design can be seen as shifting away from the traditional goal of rhetorical practice: "Contemporary information designers seek to edify more than persuade, to exchange ideas rather than foist them on us" (p. 1).

There has been much recent debate about the differences between information architecture and information design, but for the purposes of this chapter, we follow the lead of Peter Morville, who saw information design as focusing on presentation and layout on a two-dimensional page, while information architecture stresses the structure and organization of entire sites (S. Hill, 2000, ¶ 23). In terms of web design, information design is often subsumed under the larger rubric of information architecture and focuses on the visual presentation of information, such as data displays or quantitative information (Miijksenaar, 1997; Tufte, 1983), as well as layout and textual elements such as typography, line weight, and color (Redish, 2000; Schriver, 1997; Williams, 2000). But, as Carliner (2000) pointed out, information design is concerned with more than just the physical elements of page or screen design; it also encompasses what he called *cognitive design*, or defining the user's performance goals and preparing solutions that address them, and *affective design*, or shaping communication products for their optimal emotional impact.

Both types of design practices are important for website development, but we focus primarily on information architecture because it represents a more radical departure from rhetorical theory than does information design. In information architecture, the goal is not persuasion or edification, but information access. Particularly for large websites, there are multiple actions a user can take from any given page; therefore, no one "right" answer or next step exists. Although information architecture concerns itself with the ordering and structuring of information spaces, the process is much less linear than that found in traditional rhetoric and is not always tied to the dictates of audience and context. As a design practice, information architecture usually concentrates on three primary facets of a website: site structure, page relationships and navigation, and page layout and design. Note that this last item is generally the province of information design, which is why we say the two design practices are closely identified when it comes to production of digital media such as websites.

Site Structure

Wurman (1997) posited five ways in which information can be ordered, represented by the acronym LATCH: by location, alphabet, time, category, or hierarchy (p. 17). Yet in practice, most websites use a hierarchical structure because many users find tree-based structures more familiar and easier to use than other schemes. As a result, most sites are based around a hierarchy that mimics offline structures, such as outlines or taxonomies from library science. But there are exceptions to this rule. Yahoo! and other web portals often use a mixed alphabetical/categorical scheme when indexing websites according to subject.

Two basic approaches to construction of site structure exist within information architecture, one involving the discovery of inherent structures within a body of information that hold true universally across various situational contexts. This contrasts with a second approach in which the designer seeks to create structures for specific users or audiences. We refer to these two approaches as:

- **Inherent structure**—design process with a main premise that information has its own structure. Designer relies on a sense of the inherently "right" way to structure information based on characteristics of the information set.
- **User-centered structure**—design process in which the designer creates a structure that works for a particular audience or group of users. Designer relies on focus groups and usability studies to guide the design process.

Many website projects often begin with analysis of users' information needs, but designers also spend a great deal of their time just cleaning up a site in order to make sure that certain elements work the way they are "supposed" to. As Rowland (1993) noted, design is often perceived as a series of personal choices based on a subjective sense of what the designer feels is correct in a localized context.

These two modes of structural design are not mutually exclusive, because many site designers toggle back and forth between the two as a site design evolves over time. In essence, the construction of hierarchy is a constant oscillation between concern for the logical organization of the information itself and allegiance to the localized needs of users. This tension between inherent structure and user-centered approaches is closely akin to what Buchanan (1989) called the "twin premises" of technological reasoning, one of three elements of modern design arguments that maps closely with the rhetorical concept of *logos*: "Technological reasoning is based, in part, on an understanding of natural and scientific principles that serve as premises for the construction of objects for use. It is also based on policies drawn from human circumstances, that is, from the attitudes and values of potential users and physical conditions of actual use" (p. 96). Regardless of which approach a site architect may favor, there is a fairly standard process for construction of site hierarchy. First of all, the site architect determines the number of hierarchical levels within a site and the number of user options within each level, the latter of which is often called "width and depth." In tandem with this procedure, the site architect follows a fairly detailed set of rules about how to create user-based labels that allow the site to meet the users' goals. Generally, categorical labels should be accurate and descriptive, but not too long. Creating taxonomies is a definite skill, but there is no way a site designer can take into account all possible taxonomies in a user-centered design. Once labels are established, individual pages within the site are then categorized into different sections and further development of individual pages proceeds from there.

As Rosenfeld and Morville (2002) noted, labels within a site architecture can serve not only as primary paths for site navigation, but also as indexical tools for classifying the contents of large sites. Such labeling systems give users an overarching view of the site's main content. But on individual pages throughout the site, one might also find more localized labels within the main body text that lead to further information on other pages. These embedded links were the most common form of linking on early web pages, but have fallen out of favor to some extent because they distract from the reading of page content. They are being replaced by more sophisticated navigation systems such as JavaScript pull-down and roll-over menus, or by simple header labels, which serve not only as hypertext links, but also as headers for chunked text on the page.

Construction of site architecture is further complicated by whether the site is delivered statically or dynamically from the web server. In a static site, pages remain the same regardless of user interactions and are changed only by deliberate designer intent. Each page is written separately and organized within the overall structure of the site. Dynamic sites, on the other hand, involve pages whose content is created by a server-side database. For such sites, the designer's job is to anticipate as many transactions as possible between users and the database and to design templates accordingly. Dynamic sites usually have no taxonomy or one so loose as to be meaningless. Some are so simple that they are basically search engines, with perhaps merely input and results, although thousands of results can fall into a single template. In such a situation, the architect's job is to focus on potential user paths in order to anticipate what types of information will go where. Because an architect cannot anticipate all information generated by a database, templates are usually heavily tested to a certain level of accuracy before being deployed throughout the site.

Page Relationships and Navigation

Although establishing site hierarchy is a foremost concern, getting the hierarchy right is not enough. On a large-scale website, users tend to "drill down" through levels of the established hierarchy to find the pages they want. For this reason, site architects establish a set of common user intentions to help design the sequence of pages that users see within certain sections of the hierarchy. This sequencing of pages is often referred to as *transaction flow* and involves determining not only how many links users must click for a particular information transaction, but where they must look on a page for their next step. In determining the sequence of pages in a transaction flow, designers try to anticipate all possible interactions between users and information within the previously established hierarchy of the site.

The design of such transaction flows is closely akin to the architectural concept of *wayfinding* introduced in the 1970s to replace the notion of spatial orientation, or one's ability to mentally represent a place (Passini, 1999). In contrast, wayfinding refers to people's use of information to make and execute problem-solving decisions related to navigation of architectural, urban, or geographic space. Passini (1999) specifically applied wayfinding to the design of signage and public spaces, but it can also be applied to information architecture or design as a process for helping web users make and execute decisions in achieving their information goals. In terms of website design, wayfinding can be seen as a helpful metaphor for deciding what information is needed when and where in order for users to make accurate navigational choices and decisions to achieve their goals.

Page Layout and Design

Page layout and design often fall under the realm of information design, which evolved out of earlier fields such as typography, graphic design, and document design. As Schriver (1997) noted, some practitioners within these fields use the rhetorical approach to stress audience needs over designer intuition. In this regard, information design is similar in many ways to recent extensions of the rhetorical tradition within technical communication that focus on visual elements

(Kostelnick, 1996; Kostelnick & Roberts, 1998). Regardless of its name, the design and layout of web pages involve using such elements as color, typography, and position to prioritize the way in which users read information on the screen. The designer must ensure that multiple user intentions or goals can be met within the page design and that this layout relates logically to the structure and labeling system of the entire site.

But page design for the web is different than that for print documents because of technological differences in the way pages are rendered and in the way users read textual information within each medium. Despite improvements in online typography such as Microsoft's *ClearType* font system, type is still more difficult to read on screen than on the printed page because of low screen resolutions (B. Hill, 2000). This, combined with the fact that readers are using a medium that continually beckons them away from the page, has led many web designers to advocate a fundamental shift in the way we write for web pages (Kilian, 1999; Morkes & Nielsen, 1997, 1998; Nielsen, 1996, 1997; Spyridakis, 2000). Nielsen (1996), for example, stated that because users are reading material through a browser with limited screen real estate, writers should employ the inverted pyramid structure—long used by newspaper journalists—in which information is prioritized and ordered from most to least important.

Adding to the difficulties of web page layout and design are color and text placement problems that are compounded by how different browsers and platforms render these elements. Of course, technical problems of this sort also crop up in the production of print documents using desktop publishing software, but the fact remains that there are many web page elements that designers simply cannot control. User control over browser preferences prevents the level of design control achieved with print documents, although extensions to HTML such as Cascading Style Sheets are giving web designers a greater level of textual and spatial control than they ever had before.

Site Comparisons

To better explain some of the concepts and principles of information architecture, we return to the Sun Microsystems and Firestone sites analyzed earlier through the lens of persuasive rhetorical theory. In some ways, the sites are actually quite similar in that they provide access to the same types of information from the homepage and use similar navigation systems to provide that information. However, the effectiveness of each solution varies based on the way the page is laid out and how the architecture is structured. Each homepage presents the following six information types:

1. **Global navigation.** The core of the site architecture, global navigation presents the main "categories" of the site and enables the user to navigate into those sections. Usually, sites present their most important topics or areas of focus as

global navigation elements. For example, a site like Amazon.com would list its major categories of books, movies, toys, and so on, as global navigation elements. In many cases, the global navigation options are unique to the site or company.

2. **Utility navigation.** Utility navigation is a secondary navigation system that provides access to less used or less central functions. Usually, sites present utility navigation elements in smaller type and in a less visible location, so that users can find them when needed but are not distracted by them otherwise. For example, a site like Amazon.com would list functions like the shopping cart, account setup, and customer service as utility navigation elements. On many sites, the utility navigation options are consistent; functions such as customer service, "about us," and "contact us" are often treated the same on many different types of sites.

3. **User type navigation.** Just a few years ago, sites were structured only around global navigation and utility navigation. Unfortunately, many users find this structure to be limiting. For example, users may be unable to determine if the information they need lives under a "Products" section or a "Services" section. So sites developed complementary navigation systems to enable users to access the information in different ways. One of the most common approaches is to offer navigation by user type, so users can self-select their user type from a list and find pages tailored to their needs. The rationale for these types of navigation systems is that users will be able to identify themselves in a list, even if the global navigation categories are indistinct or unclear.

4. **Quick access pulldown.** Another type of complementary navigation system is a quick access menu, often presented as a pulldown. Because pulldowns conserve screen real estate, sites can present a large number of options to the user in a relatively small space. Users have to click on the pulldown to see the options, which means that users need to have a fairly high expectation that what is in the pulldown will meet their needs. Also, pulldowns can be difficult to select from, requiring somewhat more physical agility with the mouse than links on the page. As a result, pulldowns tend to be used more by expert users or by users who are very familiar with the site and want to get to a known page quickly.

5. **Featured image.** Sites often use a large image to set the tone for the site and for their brand. Although these large images take up a lot of screen real estate and require a more substantial download, many companies feel that this imagery is necessary to convey their identity online. Sites without this kind of imagery tend to feel dry and utilitarian.

6. **Timely or updated content.** Sites have become easier to update due to content management and syndication technologies. As a result, many sites present more timely information on their main page. The expectation is that users will visit the site more frequently to get updated information, or that users are likely to be visiting for the purpose of finding a particularly timely piece of information. Sites often use their ability to update content to push messages of interest or press releases to users.

Sun Microsystems

Sun Microsystems presents these six types of information in a particularly effective way (see Fig. 4.3). Its global navigation system is accessed through six large boxes with associated images. Many sites present their global navigation as a small strip of options near the top of the page, which may not be as effective because the most important navigation elements are then constrained to a relatively small space. Sun, on the other hand, takes up significant real estate presenting these options to the user, which increases their importance and visibility. Because the total real estate is much larger, Sun can break with the common convention of placing the global navigation elements at the top of the page and not worry that they will be overlooked by users.

Sun also presents its complementary navigation systems effectively. Utility navigation is small and out of the way, but its white text on a black background makes it noticeable when users need to find it. These user types not only make it easy for Sun's varied customers to find information tailored to their needs, but also reflect a business strategy aimed at promoting Sun products at all levels of an organization. As shown in Fig. 4.4, Sun's quick access pulldown is particularly effective. It is based on the same hierarchy as the global navigation system, but is clearly designed to provide quick access to important topics especially relevant to Sun's expert technical customers. Sun maximizes its use of screen real estate in presenting timely content. The list of new information starts slightly above the visible page (or "fold") and extends as the user scrolls downward. Users who are looking for this type of information will be enticed to scroll down, whereas users who want other information will not have to. Sun's information architecture is so effective that they are even able to include other navigation systems. They offer a secondary navigation bar highlighting specific sections of the site, such as press releases and job listings, and they even offer a search input box.

Firestone

From an architectural perspective, Firestone provides access to the same types of content. But Firestone's navigation pathways are as ineffective at getting users where they want to go as its rhetoric is in assuaging consumers' concerns about the quality of their tires (see Fig. 4.5). Firestone's global navigation sits toward the far right of the page—a poor choice, given that the eye will enter the page at top left and will then probably bounce around the page looking for navigation options. These options reflect the interests of the company more than those of the user. Brief, one- or two-word labels do not effectively convey the content beneath. What can the user expect to find under "Diversified Products"? What is the difference between that and "Merchandise"? The second level navigation options are presented as a rollover—an overengineered solution that does not add real value to the user. A better solution would be to prioritize the options around what users

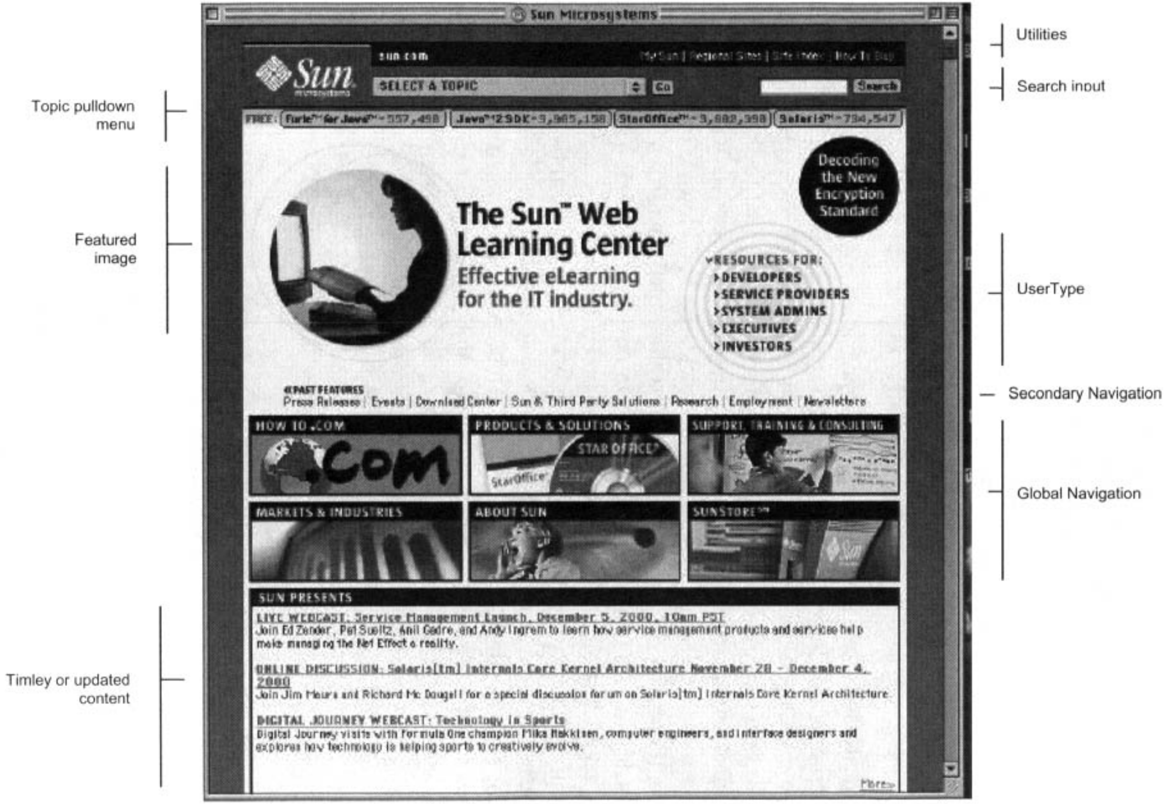

FIG. 4.3. Sun Microsystems' website.

FIG. 4.4. Sun Microsystems' pulldown menu.

most commonly look for and to use the available screen real estate to show more information about each option.

Utility navigation is slightly distinguished from global navigation, although both are presented in the same typeface and color. This differentiation is not significant enough to add value to the user and may serve only to confuse customers. Because there are relatively few global and utility navigation links, it is possible that the lists could be combined, or the utility links could be called out in a different way. Firestone's use of user type navigation links is fairly effective from an architectural standpoint—the links are placed where they will be easily seen by new visitors, are presented in an eye-catching color and typeface, and will direct visitors with an urgent information need to the right place. Firestone also offers a quick access pulldown. It is structured around the global navigation options and should enable frequent visitors to find what they need quickly.

Firestone also devotes significant real estate to timely content, but the presentation could be more effective. The headlines shown are graphics rather than HTML text. This not only increases the time it takes for users to download the page, but it increases the time it takes Firestone to modify and update the timely content.

COMPARING DESIGN SYSTEMS

Persuasive rhetorical theory and information architecture have much in common, which can easily be seen if one examines some of the primary goals of information architecture and tries to map them onto the three modes of persuasion. Although he does not refer to Aristotle's three divisions by name, Rosenfeld believed the field of IA focuses a great deal of its efforts on the interrelated aspects of these modes: "Every information architecture is different, and should be. Why? Because a successful information architecture ties together users and content, all against the backdrop of what the sponsoring organization's goals and constraints are. And

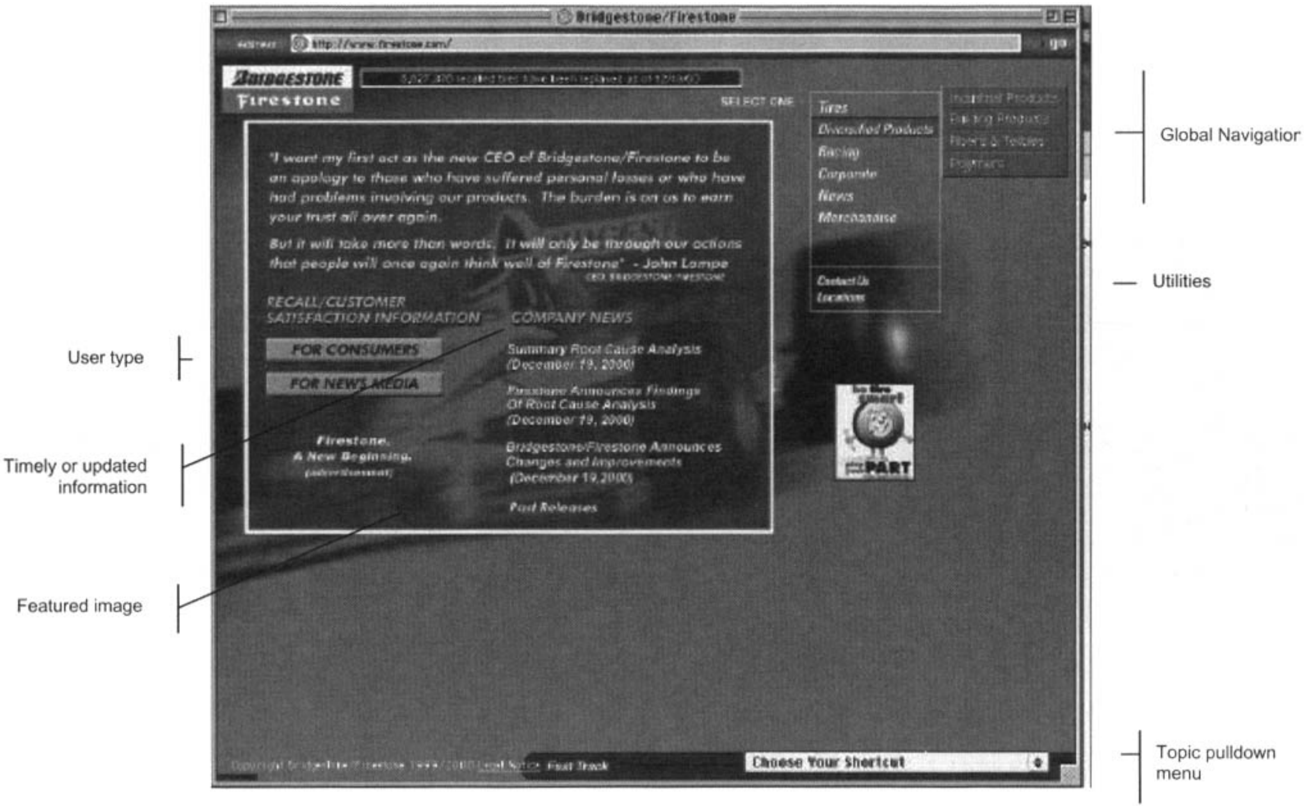

FIG. 4.5. Firestone's website.

those things—users, content, and organizational context—all are highly variable in each situation" (S. Hill, 2000, ¶ 44). Beyond touching on the three modes of *logos*, *pathos*, and *ethos*, Rosenfeld also commented on the contextual nature of combining these three elements, harkening to the rhetorical principle of *kairos* as espoused by the ancients.

If one examines these two design philosophies at their component levels, then one again finds striking similarities, although their taxonomies, as compared in Table 4.1, are radically different and their concepts focus on technological aspects of differing media. As we have argued throughout, rhetoric and information architecture share a great deal of concern with audience, although rhetoric's traditional objective in this regard has been the persuasion of audience through emotional appeals, logical argument, or subtle appeals to speaker reputation. Information architecture, on the other hand, is concerned more with providing website users with access to information. Individual pages of a site can certainly be written according to the traditional persuasive concerns of rhetoric, but making sure that users can locate and access the information they need is the field's primary concern.

Of course, the organizational objectives of a site's sponsoring company often enter into the design of site architecture, and we do not want to give the impression that all user actions and transaction flows are nonpersuasive in nature. Information architecture is concerned with helping users achieve their information goals, but there is often still a persuasive component involved. E-commerce itself is a form of persuasion in which online shoppers are given enough information about the company and its products to convince them to type in their credit card number. This issue of online trust is one that has been taken up recently by many in the field of computer science (e.g., Resnick, Zeckhauser, Friedman, & Kuwabara, 2000; Shneiderman, 2000), and the field of rhetoric should be exploring this avenue as well.

TABLE 4.1
Comparison of Rhetoric and Information Architecture

Divisions	*Traditional Rhetoric*	*Information Architecture*
Logos	Logic, formal argument	Site structure, content, and functionality
Pathos	Audience persuasion	User-centered design, information access
Ethos	Speaker character/reputation	Organizational objectives, constraints
Canons		
Invention	Heuristics, commonplaces	Prototyping, concept testing, business strategy
Style	Plain/ornate, word choice	Visual identity; labeling, microcontent
Arrangement	Linear arrangement	Hierarchy, transaction flows, page layout
Memory	Mnemonic devices	Database searches, bookmarks, URLs
Delivery	Speech or print	HTML, graphics, animation, video, sound

In terms of the five canons of classical rhetoric, there are several parallels that can be made with the design elements of information architecture. As Table 4.1 demonstrates, invention strategies within information architecture are much different from the heuristics and commonplaces of traditional rhetoric. Information architecture uses detailed business strategies and concept testing to guide construction of site architecture, which is usually designed in some detail using visualization programs such as Microsoft's *Visio* or the site diagram feature of a site management program such as Adobe *GoLive.* Once initial conceptualization is complete, the architecture and transaction flows are then prototyped in HTML and tested and refined through usability studies. The canon of style, which traditionally concerns word choice and figures of speech, finds a parallel in information architecture in the concepts of visual identity, navigation labeling, and what Nielsen (1998) called "microcontent," the short phrases in web page titles and headers used as indexical devices by web search engines. It might also include writing individual web pages in a style that is most appropriate for the medium, as in Nielsen's (1996) suggested inverted pyramid style. In many regards, the canon of style is also strongly echoed in the field of information design, where language choice and visual imagery work in tandem to create a certain rhetorical effect on the page, be it print or electronic.

Within the canon of arrangement, however, we have a different story. Whereas arrangement in traditional rhetoric concerned itself with the order in which information should be presented, that order has usually been linear in nature. Speeches were delivered from beginning to end, with points made in a predetermined order, and most genres of text were also constructed to be read in a linear order. Of course, there are exceptions in the world of print. Dictionaries and other forms of reference materials were never designed for linear reading, but for random access that in some ways mirrors the nature of hypertext. But in a full-scale website, there are so many different points of entry to the site's content that rhetorical notions of arrangement no longer hold true. Traditional linear arrangement gives way to the concept of wayfinding in which users are provided information at certain points to help them make intelligent navigation choices in what would otherwise be a labyrinth of content. The job of the information architect is to design logical hierarchies, lay out detailed transaction flows, and ensure each page supports intelligent navigational choices.

The canon of memory, of course, has not been a hallmark of rhetorical practice for some time, having faded in emphasis during the late Middle Ages and Renaissance. Political and historical forces can also be blamed, but memory's decline generally came about because of the perfection of external memory sources, namely, cheaply available paper and refined writing tools. But the canon of memory can serve as a useful metaphor in the construction of websites. First of all, site hierarchies and their accompanying labeling systems can be seen as a form of memory to guide users through information spaces in ways similar to how ancient rhetors used architectural mnemonics to arrange and deliver speeches

(Carruthers, 1990). Second, search functions found on many websites are an additional way of bringing users back to sections of the site they may have visited before, but for which they can no longer recall the navigational path. Memory, in this sense, is not an aid to composition and delivery, as it was in traditional rhetoric, but a way in which to support the user experience. Bookmarks and history files stored on users' computers also help them remember previously navigated paths to key information.

The fifth canon of delivery, also forgotten to some extent along with memory, will have increasing importance during the information age because of the different types of delivery media now available via the web. Although it began with text and simple graphic files, the web is currently experiencing an explosion of different media that includes sound, animated graphics, and digital video such as Apple's QuickTime. As Welch (1999) noted, a revived canon of delivery based on digital media is changing our conceptions of literacy, not only introducing new forms based on the dominance of the oral/visual, but also strengthening traditional text literacy, as witnessed by the growing number of print works (p. 154). This broadened sense of digital delivery provides site architects with any number of ways in which to present information to their audiences. What once was only available in print (e.g., technical directions on how to install additional memory in your computer) is now available in print, HTML, PDF, and video formats (for an example of the latter, see Apple Computer, 2000).

As we have demonstrated, there are many apt parallels to be made between traditional rhetorical theory and information architecture. Buchanan (1989) even extended the persuasive definition of rhetoric to all acts of design and argues that designers "actually [are] creating a persuasive argument that comes to life whenever a user considers or uses a product as a means to some end" (pp. 95–96). But in many respects, persuasive rhetorical theory does not adequately address many of the concepts being developed in information architecture for the construction of large websites. And those rhetorical concepts that are being applied to website design are mostly referred to by other names within digital design shops.

For these reasons, we believe an alternative view of rhetoric is better suited to the field of design as a whole and to the design and use of digital media in particular. In contrast to the persuasive view, Welch (1999) proposed a postmodern Isocratic rhetoric based on expanded notions of logos and literacy, and geared primarily to electronic modes of communication such as television and the Internet. For Welch, logos was no longer the structured, logical presentation of speech, but instead an Isocratic concept that was "more associative than linear, more concerned with belief and 'right' action" (p. 32). Likewise, her new conception of literacy involved "not only the ability to read and write but an activity of minds (the plural is required) capable of recognizing and engaging substantive issues along with the ways that minds, sensibilities, and emotions are constructed by and within communities through specific technologies" (p. 67). In constructing an electronic rhetoric, Welch's goal was to "reconstruct classical rhetoric from a series of inert prescriptions . . . into a comprehensive system that depends on weaving articulation and thought, places an emphasis on the production of discourse, and is not confined to the analysis of discourse" (p. 44). She devoted much attention to the "screen literacies" of broadcast television and the Internet, but her descriptions of these media focused almost entirely on the user experience and very little on how one might use rhetoric, reconceived or otherwise, to construct large-scale web sites or other digital media.

For us, creation of a pragmatic rhetoric of hypertextual design is dependent on viewing rhetoric not with a goal of persuasion, but as a heuristic for *decision making*—both in how designers construct a site and in how users navigate them. As we have shown in our discussion of information architecture, the concept of *wayfinding*, or user navigation, is instrumental to the act of website design, and in our experiences, the user-centered design of large-scale websites hinges on deciding how to model the numerous, incremental decisions that users in a broad or specified audience will make when they visit a site's opening page. In other words, a rhetoric of web architecture should be a system for making decisions about the construction of digital artifacts while at the same time helping users make their own information decisions.

This deliberative aspect of design rhetoric is another that Buchanan (1995) touched on in "Rhetoric, Humanism, and Design." Of course, rhetoric has a long history as a system of public deliberation going back to Isocrates and beyond, but here Buchanan highlighted how persuasion works within the act of design, not as its primary external goal:

> Design has become an art of deliberation essential for making in all phases of human activity. . . . Deliberation in design yields arguments: the plans, proposals, sketches, models, and prototypes which are presented by designers as the basis for understanding, practical action, and production. Design is the art of shaping arguments about the artificial or human-made world, arguments which may be carried forward in the concrete activities of production in each of these areas, with objective results ultimately judged by individuals, groups, and society. (p. 46)

In this regard, the incremental decisions that a web design team makes on behalf of future users form a chain of linguistic and symbolic artifacts—e-mail, user profiles, site diagrams, navigation flows, taxonomies, hyperlink labels, graphic images, and animations—all of which contribute to the emerging design and the eventual virtual landscape through which users will navigate seeking to satisfy their own informational needs. Persuasion is sometimes an objective within such virtual worlds, but the primary objective in web design is creation of a hypertextual environment where users feel comfortable pursuing their information goals. To this end, a well-designed website will anticipate these needs and provide the textual, navigational, and visual means by which individuals find their way.

Although the deliberative history of rhetoric has been focused mostly on political discourse and civic goals, we believe rhetoric can also serve as a heuristic guide in design deliberations in ways similar to those espoused by Enos (1985) when arguing for rhetoric as a guide for group decision making. According to Enos, the heuristics of classical rhetoric are capable of structuring a group's thinking and providing explicit means for inventing resolutions of problems. But rhetoric in this regard can also guide the design of digital artifacts whose very existence is to serve the incremental deliberations of individual users as they navigate virtual space.

In most cases, such design deliberations seem far removed from the public sphere and appear closer to the realm of practical affairs as categorized by Aristotle. Yet no less than the chief proponent of deliberative rhetoric in the classical age saw rhetoric as working in both our public and private lives. In his letter *To Alexander*, Isocrates (1968) wrote that rhetoric "is of use in the practical affairs of everyday life and aids us when we deliberate concerning public affairs" (p. 4). For Isocrates, rhetoric plays an active role in our lives by allowing our internal and external deliberations of thought and speech to guide us in the act of decision making about our individual and political destinies. It can manifest itself in websites concerned with public issues and political rhetoric, but it can just as easily be used by design teams constructing these type of sites and even those with more mundane goals, such as buying a novel or learning how to treat indoor plants infested with aphids. For us, a successful rhetoric of web design is one that synthesizes the heuristic components of deliberative rhetoric with the emerging elements of information architecture. The next section provides several suggestions about how such a synthesized rhetoric can be achieved within the technical communication curriculum.

PEDAGOGICAL SUGGESTIONS

There is no question that students need to know how rhetorical theory can be used in the analysis and construction of professional websites. In particular, it benefits students to know the ever delicate interplay between *logos*, *pathos*, and *ethos* and how these elements are constrained by certain factors of the rhetorical situation, such as technological support. However, we believe that a pedagogical synthesis of rhetoric and information architecture is necessary within technical communication programs if we hope to prepare our students for the digital workplaces of tomorrow. As we have argued throughout, the goal of a digital design rhetoric cannot be solely persuasive; instead, we advocate a broader, deliberative view of rhetoric that has as its goal ethical decision making within both public and private forums.

Collaboration has been a hallmark of technical communication classrooms since the early 1980s, and it is increasingly important to teach web design using a team approach because so few professional site designers work in isolation. Web design teams are commonly made up of project managers, information architects, writers, graphic designers, HTML developers, and back-end programmers, each bringing their own ideas, values, and terminology to the project. Teachers of technical communication need to ensure that students can work in cross-disciplinary teams and can work successfully with people of different backgrounds and viewpoints. The student makeup of many web design classes makes cross-disciplinary collaboration quite easy. At Iowa State, for example, the English department's Writing for the World Wide Web class routinely draws fewer English majors than it does those from other disciplines, including architecture, graphic design, and computer science. For this reason, we often have students work in cross-disciplinary groups so they can draw on the diversified expertise of others. Wambeam and Kramer (1996) also suggested collaborative design teams for website projects and advocated using a dialogic model of collaboration in which a "reliance on the shared knowledge and abilities across the team would grow along with personal development and knowledge of shared and individual skills" (p. 355).

What makes collaborative web design different from other technical communication group projects is that the design artifact becomes the primary space of collaboration. Group sites are easily accessible through the web itself, but members also need access to supporting materials such as e-mail and prototype design documents. Additionally, students working collaboratively in distributed digital environments need to learn certain protocols for managing page version control; recent server software like Adobe's *Web Workgroup Server*, which uses the WebDAV file-sharing protocol to manage document check-in and check-out, allows distributed groups to work asynchronously on site design projects without fear of inadvertently erasing one another's individual contributions. Construction of group projects within the shared medium of the web makes it easier than ever for technical communication students to work collaboratively both in and out of regular classroom hours.

Within such digital environments of group deliberation, classical rhetoric's three modes of *logos*, *pathos*, and *ethos* serve not only as means to persuasion, but also as a broader design heuristic for ensuring that all communicative elements of the web experience are accounted for. At the same time that students learn these rhetorical terms, they also need to realize that such terms are rarely used in business and industry, and that if they plan to use their underlying concepts in web design, they most probably need to translate them into other terminology. In other words, they must be able to talk about the concepts of rhetorical theory without actually speaking its academic nomenclature. This should not be viewed as a cheapening or betrayal of the rhetorical tradition, but instead as adapting to the rhetorical situation in which students will eventually work.

Michael Gonsalves, a former Iowa State student who took a web design class in the English department's Rhetoric and Professional Communication program, worked for a time as an information architect in Razorfish's New York office. During his time there, he says he experienced a great deal of confusion about the competing design terminology of various fields and disciplines:

> The theory behind every discipline is the same. The stuff I learned in the English department is the same that I learned in journalism, public relations, and advertising classes and is the same things we do here at Razorfish. Each place just calls them different things, which can be awfully confusing. RPC's rhetoric triangle is the same as demo/psychographics is the same as user intelligence. I realize it is next to impossible to get everyone to agree on what to call things and how to teach these concepts ... but explaining to students the grand scheme of things, or even just HOW to do the work without attaching the jargon ... is really important. (personal communication, December 12, 2000)

Although fields such as information architecture and information design may unwittingly borrow concepts from rhetorical theory and give them new names, instructors in rhetorically based technical communication programs should celebrate this fact instead of viewing it as a threat to their discipline. The wider such concepts are employed—regardless of name—the better websites will meet the informational needs of their users and the purpose of their sponsors.

There are a number of concepts from rhetorical theory that parade under different names within the field of information architecture. For example, the web design technique of *persona development* is very similar to the rhetorical skills of audience analysis. Likewise, the rhetorical skills used in constructing a formal persuasive argument undoubtedly come in handy as students learn to construct *user scenarios* and use them to design a site architecture. Technical communication students may have little exposure to *branding*, but may find the process similar to the classical techniques for enhancing ethos. Finally, looking to the future of web design and information architecture, we see a growing need for skills in *taxonomy development* that technical communication students may be able to fill. In the next four brief sections, we discuss each of these concepts and how they relate to web design education within technical communication programs.

Personas: Invention in User-Centered Design

It goes without saying that students of rhetoric and technical communications need to know how to write for specified audiences. All technical communication students should be able to employ various techniques in audience analysis and find ways to shape their messages and writing style to be appropriate for their intended readers. When developing websites, these same techniques can be used to ensure the site is usable by its intended audience. Within web designer circles, the primary form of audience analysis is a technique known as *persona development*, which is used to ensure a specific and accurate depiction of the site's intended users.

Of course, personas are not a new concept introduced by information architecture to the field of technical communication. Ong (1975) brought the notion of persona development to the minds of literary scholars early on, and Ede and Lunsford (1984) showed composition studies how many writers draw on a mixture of actual and created audiences when producing text. Yet Coney and Steehouder (2000) argued that role playing "is given new vitality as it moves from a printed page to a Web page" because designers have more ways of adapting to the preferences of individual users, and users in turn can choose among a variety of roles on individual sites, "creating their own meanings by following different pathways through the information" (p. 329).

Students of technical communication should find the technique of persona development to be a natural extension of traditional approaches to writing for an audience. However, according to Cooper (2000), founder of Cooper Interaction Design and author of several books on interface and interaction design, developing effective personas requires a great deal more specificity than one might expect in traditional forms of audience analysis: "Personas are not real people, but they represent them throughout the design process. They are hypothetical archetypes of actual users. Although they are imaginary, they are defined with significant rigor and precision. Actually, we don't so much 'make up' our personas as discover them as a byproduct of the investigation process" (pp. 123–124). Such rigorous techniques include developing a deeper understanding of various demographic and psychographic variables associated with the intended user, identifying overarching user goals and mapping those goals to the tasks the user needs to perform, and even developing detailed visual representations of the user and the user's home, interests, and hobbies. Through persona development, students of technical communications can develop a highly specific and accurate conception of audience, thereby learning to communicate effectively with any audience in any medium.

Scenarios

As mentioned earlier, many information designers working the web have moved beyond rhetoric's primary purpose of persuading audiences to a broadened purpose of aiding user decision making. To this end, those teachers schooled in rhetorical theory can show students engaged in web design how rhetoric can serve as a heuristic for both design team decision making and user information choices. Although not as important as it once was, persuasion still remains a valid goal in many communication situations. For example, in organizational settings, skillful use of intranets can help determine the direction of internal policy on any number of issues. Persuasion also remains a primary purpose on corporate websites whose main function is contact with current or potential customers. These include everything from fairly static "brochure-style" sites to more interactive e-commerce sites where customers are persuaded daily to buy certain products.

In developing websites, students can draw on traditional skills for constructing persuasive arguments when learning how to construct navigational paths for users to follow through a site. In the same way that rhetoricians must construct a logical flow of argument and consider which messages will be appealing to their intended audience, information architects need to construct a series of links and pages that will lead users to their desired goal. In order to be successful in constructing such paths, web designers need to understand the user's tasks and goals, and map those tasks to a sequence of pages.

In information architecture, this process of mapping tasks and goals to prototype web pages is known as *scenario development*, in which designers document a detailed scenario-of-use that explains how users will interact with the site. Such scenarios include highlights of a site's content, functionality, or other features needed to meet users' needs.

As users navigate the site, they need to make decisions about which links to select, then take a physical action to select and click on the link. On complex websites, there can be dozens or even hundreds of links to choose from on a page (visit Yahoo! or eBay for just two examples of pages with many hundreds of links from which to choose). Scenario design ensures that the information architect designs the site with user tasks and goals in mind, thinking through the pathways users will need to follow as they choose among these many links. Then, when they make design decisions to develop the underlying page grid, select which links will appear on the page, and select colors, typefaces, and other graphical treatments like bullets and lines, these decisions are made so the user can follow the desired path through the site as defined by the scenario. Students may have traditional rhetorical skills that can assist in this process, but at present, few technical communication programs are qualified or experienced enough to teach scenario development as practiced by digital design firms.

Branding

Many students of rhetoric and technical communication will be unfamiliar with the concept of *branding*. Those who are familiar with it may associate it with advertising or even a company's logo or "brand name." But within the disciplines of web design and corporate communications, branding means much more than just a company's trademark name. Branding encompasses the entire relationship a consumer has with a company, how it engages consumers and persuades them to interact with a company's products or services. In *Emotional Branding*, Gobé

(2001) discussed branding as a long-term connection between a company and its customers:

> In this hypercompetitive marketplace where goods and services alone are no longer enough to attract a new market or even maintain existing markets or clients, I believe [a great brand] is the emotional aspect of products and their distribution systems that will be the key difference between consumers' ultimate choice and the price that they will pay. By emotional I mean how a brand engages consumers on the level of the senses and emotions; how a brand comes to life for people and forges a deeper, lasting connection. (p. xiv)

For students of rhetoric, what is called branding in the professional world has its roots in the *pathos* and *ethos* of rhetoric. Yet students need to expand their conception of *pathos* and *ethos* to include everything from logos (the semiotic concept, not the rhetorical one) and color palettes to product names and features.

Taxonomic Skills

Because technical communicators are most often hired for their writing skills, they may be unfamiliar with the development of taxonomic systems used in site navigation and indexing. As Rosenfeld and Morville (2002) noted, development of taxonomic systems is a skill usually developed within the confines of library science. But as the web becomes a primary medium for the delivery of technical information, taxonomy is a skill technical communicators need to learn in order to link together web content in a way that makes sense to various audiences.

As sites become more complex and dynamic, information architects will be expected to construct larger taxonomies, going beyond just the site's navigation system to include deeper facets of, say, a company's product catalogue, and even including related terms mapped in through a thesaurus. Often, an information architect with a degree in library science is needed to create these large-scale taxonomies, but an opportunity exists for technical communication students to apply their existing skills in language and communication to this area. Their facility with vocabulary definitions and information structures may make technical communication students better suited for these activities than information architects with a background in human–computer interaction or graphic design.

FUTURE PROSPECTS FOR TEACHING WEB DESIGN

From its public debut in the early 1990s, the web has evolved from simple pages with embedded hyperlinks, a gray background, and a single GIF image to a widely used medium that supports sophisticated design and a rich spectrum of content forms, including PDF documents, MP3 music files, animation using Dynamic

HTML and Flash, and streaming video using QuickTime and RealVideo. Developing and structuring information using this palette of digital types requires that technical communicators plan and test their information products in ways quite different from those of the past. To design effective video modules, for example, technical communicators should be familiar with film script and storyboard techniques often used by Hollywood writers and producers (Shelton, 1993). Students in a 15-week web design class may never get around to producing digital video for web delivery, but they still need to be exposed to basic techniques for designing short information videos and other interactive medium on the web.

But one of the biggest challenges that technical communicators face in the web's future is the change promised by the advent of Extensible Markup Language (XML). Similar in many ways to HTML, XML uses a separate markup language to describe the structure and content of a particular document. This supposedly makes documents not only easier to write, but their content easier to read by a variety of computer applications. The challenge in using XML and its transitional cousin, XHTML, is not in the code itself; it is not that much more difficult than HTML. The change is in how the tags are used. HTML tags describe the structure of a document and how text appears on the page, whereas XML tags describe what kind of information is in the text. With its ability to provide detailed description of page content, XML will shift taxonomic labeling from links and navigation systems into the code itself, thus creating more detailed results for search engine sessions. As a result, site designers will have to be much more explicit in how they define both the elements and the structure of a single web page.

A full technical description of XML is neither possible nor necessary for this chapter, but suffice it to say that approaches to site architecture will change dramatically if XML eventually replaces HTML. XML promises to do more than just provide meta-information about page content; it will allow technical communicators to repurpose information with relative ease into a variety of other media forms, such as WebTV, wireless PDAs, cell phone displays, and voice translation for the sight impaired. It is much too early to begin teaching XML in a basic web class, but the eventual shift to XML will drastically change the way we teach web design. Not only will students have to be knowledgeable about site navigation and page design, they will also have to consciously map out and describe, at the code level, the content of each and every web page of their site.

As future web technologies are adopted, however, there are many things about teaching website design that will remain constant. The need for achieving balance among modes of the rhetorical triangle will remain the same as organizations use the web to bolster their prospects in cyberspace and to fulfill the information needs of their clients and customers. Students will continue to need instruction on how to structure large-scale sites and to develop navigational systems based on detailed taxonomies useful to a wide range of users. Software tools for developing such systems will undoubtedly improve with time, but the underlying skill of structuring and developing such systems is something independent of particular programs. It comes from designers who know the medium well and who can empathize with future users of the site.

Unfortunately, however, empathy is not a skill that can be taught easily. In developing their sites, designers often perform usability tests on subjects who are presented with a case scenario and then asked to carry out a certain interface routine, such as using a pull-down menu. During these studies, many designers have a difficult time accurately observing users, getting inside their heads, and then making design decisions based on this information. It is easy to teach tangible skills, such as interview techniques and report writing, but the intangible ability to get inside a user's head and know why they are having a problem is a talent that derives from *pathos.* And one cannot really teach *pathos.* The ability to deeply empathize with others is something that comes from life experience and is a quality good designers must have. A good web designer listens and understands immediately why a user is having problems with a pull-down menu, often without needing to ask why. She hears past what is being said to what the user really means. A great designer *becomes* the user during the act of design.

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5

A New Web for the New Millennium

John F. Barber
University of Texas—Dallas

Given the current symbiosis between information technology and cellular telephony, there are substantial grounds for predicting a future World Wide Web that operates without wires to connect its components. Like the Current Web, this so-called Wireless Web will provide a context for rich multimedia content. This content, however, will be intended for display on a plethora of handheld wireless devices. Production of content for such devices may well fall to future technical communicators.

This chapter speculates about such a Wireless World Wide Web, and about skills that future technical communicators might draw on to produce its content. As content providers for the Wireless Web, future technical communicators may need to be more than talented writers and editors. They might benefit greatly from backgrounds in design, art history, visual communication, and visual design, as well as from skills in specific media production technologies and computer and/or wireless telephony programming languages. Technical communication educators might well adapt their service and/or degree programs to include the teaching and learning of such skills.

Given the nature of the Wireless Web addressed here—dynamic, fluid, and constantly changing—interesting questions are sure to arise for technical communication educators:

- How might a Wireless Web be different from the Current Web?
- How might it be the same?
- What communication and information-sharing scenarios might a Wireless Web facilitate?

- What kinds of content might a Wireless Web require and/or promote?
- What skills might best equip students to produce such content and to become effective web communicators?

Definitive answers, as well as specific recommendations and/or educational programs, may prove difficult to provide, again because of the predicted dynamic nature of the Wireless Web. Rather than prescription, the intent of this chapter is to promote further discussion. Technical communication educators and students, realizing the implications of the speculations here, may want to adjust their teaching and learning to take advantage of the challenges and possibilities afforded by the Wireless Web.

HOW THE CURRENT WEB WILL CHANGE

The terms *Internet* and *World Wide Web* are often used synonymously. Each term signifies a global computer-based communication and information-sharing technology. Each term, however, speaks to a different component of this technology. The Internet is, at base, a network of computer networks. The World Wide Web is a technology for viewing and sharing the content provided through the Internet.

The Internet was developed in the 1960s as a technology for connecting a handful of geographically separated computers (Hafner & Lyon, 1996). Today, the Internet is a global collection of computer networks woven together by various forms of telecommunications. On the Internet, communication and information sharing seem to occur instantaneously.[1] In addition to communication, the Internet has also become a vast site for commerce. Individuals and businesses daily buy and sell a broad variety of goods and services using the Internet. As new online commerce and communication possibilities form daily, the full impact of the Internet is yet to be realized (Wolf & Zee, 2000).

In fact, the full impact of the Internet may never be realized. The Internet may never be complete, that is, it may never be a static whole. The Internet may always be undergoing constant change, driven by the convergence of several factors, including the following:

- The increase of business-to-business connections and revenues. Currently, many businesses are trying to augment their existent customer retail channels with electronic, online, web-based shopping and/or customer service offerings. A future lure involves selling directly to (or buying from) other businesses or companies through some sort of web-enabled interface. For example, Amazon.com uses an extensive web interface operated mostly by online customers to buy and

[1]For more on the history of the Internet, and ideas about its future, see Campbell-Kelly and Aspray (1996), Ceruzzi (2000), and Naughton (1999).

ship directly from other company warehouses, cutting storage and shipping costs. For companies like Amazon.com, such arrangements are expected to expand revenues 25 times the current annual sales levels (Ward, 2000).

• The promise of fiber optics. Currently, each fiber optic strand, made of glass thinner than a human hair, can carry two trillion bits of information a second. Researchers and marketers suggest they may soon carry five trillion bits of audio, video, and data at the speed of light, anywhere in the world. The revolution toward light-fast transmission of data is just beginning.

• The growing availability of wireless technology. Currently, computers can interact with a number of different devices using a wireless network. The range of such networks is currently small, but researchers and marketers predict it could extend up to 6 miles. This means that short-range wireless networks may replace cables and cords to connect computers directly to electronic books, music, movies, and software. For example, the entire contents of the 32-volume, 44-million word *Encyclopaedia Britannica* is available in searchable format by users of popular handheld wireless organizers/computers (Associated Press, 2000).[2]

• The transformative potential of voice recognition software. Currently, the computer keyboard is the primary input device. Voice recognition software may allow users to take their hands off their keyboards and control their computing devices using only the sound of their voices.

• The viability of video conferencing. Currently, processing speed and bandwidth hampers smooth video streaming between computing devices. In order to maximize speed, data content is often minimized. Video images viewed on computers often appear jerky and grainy, because "nonessential" data has been dropped in order to facilitate transmission speed. Several technologies are converging to address this problem, and may soon make web-based video streaming efficient and affordable. Their continued evolution may promote higher broadcast speed and lower loss of data, making it feasible to broadcast business meetings, classroom sessions, or other gatherings. As a result, one might not need to physically travel to work, to attend meetings, or to access services. Instead, one might "travel" electronically, "appearing" at the desired location via video conferencing. From a different perspective, video conferencing might bring people, meetings, work, and services to us wherever we are, whenever we want them.[3]

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[2]Beyond the current crop of "wireless Internet" telephones, handheld personal digital assistants (PDAs), pagers, and other devices, wireless technology may allow several "computers" to be placed on or around our bodies to provide communication, access, monitoring of body functions, and navigation (Barber, 1997).

[3]Futurist FM-2030 (1989) predicted a future "telespheral" world where two-way interactive telecommunications will "more than ever play a central pivotal role" in how people organize time and space, how they live, how they conduct business, how they structure their lives (p. 13). Telecommunications, he said, "is as indispensable to the telespheral world as the plowshare was in the agrarian period and the smokestack or the automobile is in the industrial. The freeways and byways of the new age

• The ubiquitous nature of the World Wide Web. Currently, the World Wide Web is a technology for viewing and sharing content stored in thousands of computers connected to the Internet. The Web seems to be everywhere, and included in everything. In addition to the personal computer, web access is currently available through cellular telephones, personal digital assistants (PDAs), pagers and messaging devices, and specialty computer–television combinations. References to corporate or business websites appear frequently in traditional media advertisements. Grade school students maintain personal web pages. High school students run web-consulting businesses. College students court eBusiness systems development recruiters. Yet, just over a decade ago, this medium for commerce and communication did not exist. Invented by Berners-Lee in the last three months of 1990, the Web has become a combination delivery and interaction system that permeates all levels of our culture. It changes the ways we entertain and inform each other, the ways we exchange ideas, and the shape of modern life. For example, the trend-setting television show "Who Wants to Be a Millionaire" introduced an online component into the TV game show experience, with an interactive website that allowed viewers to play along with the show and answer bonus questions. The trick was that online players had to be watching the TV show to hear the questions—an attempt on the part of the TV show producers to interweave the two different experiences (Maurstad, 2000).

Change imperatives like these may promote new forms of the World Wide Web. This chapter speculates about one possible future iteration: the Wireless Web.

THE WIRELESS WEB

The infrastructure for the Wireless Web is currently under rapid and aggressive construction by multiple service providers. Their haste is prompted by predictions of research and consulting companies that growing numbers of people (up to 10 million households) will use wireless devices in the future. Such predictions point to the availability of nonintrusive (wireless) network technology, intelligent and affordable applications, and escalating consumer demand as the primary

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are the electronic and photonic circuits that connect all areas of life. The more telecom[munications] systems you deploy the more telespheral (electronic) your environment. The fewer telecom the more industrial age your world" (p. 15).

The telespheral environment, said FM-2030, will encourage teleeducation, telemedicine, telebanking, teleshopping, telecommuting, teleconferencing, and teledemocracy: "In the telespheral world everything is decentralized, despecialized, demonopolized, debureaucratized, globalized" (p. 14). Teitelbaum (1997) examined how this prediction might play out in present-day Israel, where cheap rates and ubiquitous cellular phones are producing a nation of obsessive communicators.

drivers for this growth. Such a market is attractive for wireless service and product suppliers. They are eager to tap its potential revenues.

New Capabilities of the Wireless Web

If the predictions of companies like The Yankee Group are correct, then it is easy to conclude that wireless products and services may bring new capabilities to the households where they are introduced. What kinds of new capabilities might we see from the advent of wireless technology? Gershenfeld (1999), director of the Massachusetts Institute of Technology Physics and Media Group, envisioned computers, radios, mobile telephones, refrigerators, and even toasters working together through background agents to share information via wireless networks.[4] Models for such odd alliances are already forming in the wired world. Witness the Izek sewing machine, which when hooked to a Nintendo® Game Boy® with a special cartridge can be programmed to execute a variety of stitch patterns, including letters, numbers, and images.

Such connections and communications between different devices are called "touch points." Other touch points include cellular telephones, pagers, and PDAs. New devices, each with improved technology and increased capabilities, appear daily. As the Wireless Web evolves, communications and applications technologies may become more transparent. Interactivity may become more seamless. Some examples might include the following:

- Mobile communication devices that offer web connectivity and other features. Most cellular telephones and many PDAs currently offer the capability to browse a text-only version of the Current Web. Several, however, offer the capability to send, receive, and display digital images, video, and sound files.
- Connected appliances that allow businesses and individuals to use mechanical objects for collecting and/or transmitting data. Such wireless webs of devices may enable the building of completely new commerce and communication models. For example, following Gershenfeld's (1999) vision, a refrigerator might communicate through a Wireless Web to order more milk, produce, or champagne.
- Interactive entertainment devices (e.g., advanced television remote controls, gaming consoles, and set-top boxes) capable of accessing web-based services. More than input–output devices, these new connection and interaction opportunities add incremental value to more traditional entertainment platforms. They may also create new entertainment paradigms. For example, i-mode, a multimedia wireless technology currently utilized in Japan, allows

[4]In addition to Gershenfeld (1999), see Negroponte (1995) and Dertouzos (1997) for interesting discussions regarding the future of networked computational technology.

games and chat technologies to be downloaded to cellular telephones. This same technology is also used to facilitate online shopping or access to personal banking information.[5]

- Smart environments that recognize, monitor, and exchange information between their various components. For example, a central device may adjust home heating and ventilation settings based on information received from remote sensors and/or monitors. The same device might also turn lights on or off based on communication from timing devices or photovoltaic monitors. It might also place emergency telephone calls based on disruptions throughout the entire environment.

Biometric monitoring brings computer-controlled feedback into the human body with opportunities for self-regulating pacemakers, insulin pumps, and other medication delivery or monitoring devices. Biometric monitoring is expected to expand in the future.

Monitoring and exchanging information through smart systems is also expected to expand in other areas. Perhaps the most significant expansion may come from services built on top of smart environments like location-based advertising following requests to navigational systems. For example, a homeowner leaving work uses her cellular telephone to call her home smart environment, instructing it to begin cooking the evening meal. She learns from the central device, which monitors all the connected devices, that some ingredients for the proposed evening meal are missing. She uses her telephone to request the location of the closest grocery store. Directions appear on her telephone, along with a personalized discount offer from the very store toward which she is being directed.

- Commerce networks that facilitate mobile account access and manipulation, as well as "wireless-to-wallet" bill paying via smart cards, debit cards, and so on. This may promote tremendous new business opportunities, as well as new ways of selling existent products.[6] Many service providers and retailers currently offer opportunities for customers to check or pay bills online using the Current Web. Such opportunities surely will be carried over to the Wireless Web, and new op-

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[5]Japanese cellular phone users have access to more than 40,000 Internet sites, e-mail, online shopping and banking, ticket reservations, and restaurant advice with i-mode technology. Users can access sites from anywhere in Japan. Charges are based on the volume of data transmitted, not the amount of time spent connected. Since its introduction in February 1999, more than 29 million people, nearly one fifth of Japan's entire population, have subscribed to i-mode. For more information on i-mode, a useful Web site is "NTT DoCoMo" at www.nttdocomo.com.

[6]It might be argued that the adult entertainment industry is the real driver of developing web-based sales techniques. Banner ads, copyright policing, credit card billing, cross-selling, distribution via compression of video, audio, and text streams, encoded images, exit traffic sales, interactivity, interstitial advertisements, keyword purchasing, massing traffic, pop-up windows, search engine manipulation, subscription models, upselling, and web affiliate programs were all pioneered by the adult entertainment industry. These technologies are being quietly adopted, and adapted, by mainstream eCommerce efforts.

portunities should evolve. Japan's i-mode allows cellular telephone users to access e-mail, online shopping and banking, ticket reservations, and restaurant advice efficiently and economically. Although it operates on a wireless technology not supported in the United States, i-mode could provide a model for future development of this aspect of the Wireless Web in this country. (See footnote 5 for more information on i-mode.)

Two Models for the Wireless Web

Two models for the topologies and architectures defining the Wireless Web may evolve: server-centric and distributed. The *server-centric* model may follow the model of the Current Web, where a client device requests specific information from a server device. The server then sends instructions for displaying that information to the client.

Much of the magic of the Current Web stems from its ability to display rich media content: graphics, audio, and video, in addition to written text. The server-centric model for a Wireless Web may draw on and extend this focus. As already mentioned, wireless devices are currently available that can send and receive text, graphics, and sound files, and function as cellular telephones and/or information managers. Market demand may continue to drive future development of such wireless devices and improve their abilities to send and receive rich media content. One driver for this convergence of capabilities will surely be economic. RealNetworks, MP3.com, Emusic, Yahoo, Napster/Bertelsmann, AOL, and Time Warner currently cross-market with wireless service providers to offer rich media content and services, for a price. Other content–service provider partnerships will surely follow suit.

Despite its exciting appeal, Colony (2000) contended that this server-centric model is one-way: The server computer sends only information for which it receives a specific request. Colony, chairman of the board and CEO of Forrester, an independent research firm that analyzes the future of technology change and its impact on businesses, consumers, and society, pointed out that Current Web pages are like pages in a book. They are interesting and informative, but readers cannot converse with book and/or web pages interactively, intelligently, or collaboratively.

He proposed a *distributed* model where instead of instructions for displaying specific web pages, copies of programs or usable packages of information are shared between computers, PDAs, telephones, and other devices. "Now you've got brains at both ends," says Colony, who argued that with fully executable programs at each end of the connection, more work can be accomplished, and the relevancy of that work will be both higher and more task oriented.

A distributed model may break infrastructures into smaller, application-specific parts. For example, office workers might need only a word processing program, or even only specific portions of such a program, rather than a large suite of accounting, presentation, and scheduling tools wrapped around a program that allows them to manipulate text. Such smaller programs may be located and used on individual wireless devices more effectively than through large, isolated servers.

In this sense, application programs within a distributed model might be tailored to meet the specific needs of their users. The net result might be, according to Colony, to change users of the distributed model from consumers to service providers. As a result, information sharing may be enabled across and despite traditional and historical constraints. Traditional toll roads and bridges may be bypassed by applications that promote both commerce and communication. Interaction may be more unruly, direct, liberated, and empowered.

An early example was the sharing of music files driven by Napster, the file swapping company. Born in a dormitory room in Boston in early 1999, Napster was eventually forced out of business by a copyright infringement lawsuit brought by the Recording Industry Association of America (RIAA) on December 7, 1999 (Lewis, 2001). Napster was an application program that allowed users to download copies of digital music files from personal computers around the world, rather than from a centrally controlled server. Despite the fact that many musicians purposefully distributed their music through the Web, and welcomed file sharing by interested listeners, RIAA, prompted by alleged loss of music distribution control and royalty revenue collection, brought suit against Napster.

From the ashes of Napster rose Gnutella (a combination of "Nutella," the name of a chocolate spread and the free computer operating system called "GNU"), another file-sharing application program. More powerful than Napster, Gnutella allowed the sharing of anything residing on personal computers. Written by Justin Frankel, Gnutella was posted to the Internet on March 14, 2000 (Lewis, 2001).

Frankel was a 20-year-old employee of America Online (AOL) when he released his Gnutella program on the Internet. As a teenager in Sedona, Arizona, Frankel wrote the immensely popular program "Winamp," which allowed users to play digital music files on their computers. He sold his company, Nullsoft, to America Online, where he was retained as an employee. Believing that information should be free, Frankel released the Gnutella program during the *RIAA vs. Napster* trial, and during the AOL–Time Warner merger. He complied with a request from AOL management to retract his software, but during the 19 hours it was available on the Internet, 10,000 people downloaded copies. In another incident, Frankel wrote a software program that deleted the advertisements from AOL's Instant Messenger service (Lewis, 2001).

What Gnutella demonstrated was that an entire network of computer users could be queried for information, and file sharing could be arranged without a requirement for centralized file servers, or for the companies that control them. As Lewis (2001) said in *Next: The Future Just Happened*, Gnutella enabled peer-to-peer computing, which "made the Internet what it wanted to be, and what it was originally designed to be: an exchange of equals or, at any rate, an exchange among people on the same level" (p. 114). Oram (2001) pointed out that such peer-to-peer sharing follows the oldest architectures in the world of communication. If such information sharing represents the oldest communication architecture, then what might the future hold? One example might be a consulting physician who obtains prescription records, laboratory test results, and examination notes by other physicians in order to build a more complete picture of a new patient's medical history. The result could be more efficient health care.

Businesses may apply a similar information-sharing scenario to their supply chains, keeping key data within the corporation and distributing the rest among associates. For example, inventory reports might be pushed out to repair centers, along with viewing and ordering applications. This might allow individual technicians in far-flung repair centers to interact more knowledgeably with information about parts and supplies. The result could be more efficient and economical repair and/or service.[7]

Another scenario based on the distributed model involves extending communication collaborations to computers. "I have a dream for the Web," said Berners-Lee (1999), "and it has two parts" (p. 157). The first part of this dream facilitates people-to-people communications through shared information, and may evolve following the models suggested earlier. The second part of Berners-Lee's dream involves having computers facilitate the communication process itself.

Current Web pages are written for display to human readers, readers with knowledge of visual and written languages and a great deal of common sense. Human readers are capable of analyzing subtle nuances, comparing different presentations of the same information, and making informed connections based on desires or needs. In the future, Berners-Lee (1999) suggested, these same capabilities may be extended to computers. Future computers may be capable of analyzing the content and intentions behind the daily mechanisms of commerce and communication. By following embedded, invisible links in web pages, computers may be able to increase their ability to "understand" in the sense that they can link to multiple meanings or information sources, thus increasing their functionality.

Much like humans comparing terms in French and English dictionaries to learn their semantic similarities, computers may use inference languages embedded in web pages to compare terms and to convert data from one format to an-

[7]Distributed computing might also be used to harness idle computing power. Grid computing, tying personal computers together and using them to perform super-computer tasks, is already receiving interest—and money—from venture capitalists. Weather forecasting, feature film animation, genome-related research, or any business endeavor that requires massive computing power may benefit from harnessing the power of the Current Web's 400 million (and growing) personal computers.

other. Such inference languages may allow the combination/comparison of global and producer-specific standards allowing computers to see, read, feel, and understand the meaning behind the semantics, and to act appropriately.

Early iterations of these capabilities demonstrate their potential. Using metatags (generalized content descriptions) and specific words embedded at the content level of web pages, search engines compile lists of web pages where those terms and words appear. Using "screen scraping" (salvaging usable information from web page screen displays intended only for humans), online brokerage services (also called shopping bots or aggregators) can, within reason, compile comparisons of products, prices, and deliveries drawn from thousands of sources across the Web. MySimon (www.mysimon.com) and Yahoo! Shopping (http://shopping.yahoo.com) are two notable examples. Biddersedge (www.biddersedge.com) tracks online auction sites and reports what is for sale.

The next step may be data mining, also known as knowledge discovery in databases (KDD). Using algorithms pioneered by Tunisian-born computer scientist Usama Fayyad, computer systems can burrow through gigabytes of data looking for patterns no one can anticipate in advance. One form of KDD may be "text data mining": extracting unexpected relationships from huge collections of free-form text documents (Waldrop, 2001).

Waldrop's article hailed data mining as one of the emerging technologies that will change the world. Other experts say it will be key to delivering web pages and/or web content tailored to users' preferences (Konrad, 2001). The evolution of such technology may foster the long-touted "intelligent agents" capable of examining the Web; seeking underlying relationships, interconnections, or structures; and enacting activities based on their findings.

Despite such predictions, there are potential drawbacks to the distributed model of a Wireless Web. One involves how such a distributed model should work. Without standards, the distributed model may never arrive. But who will produce such standards? Colony (2000) indicated that standards defining how file-sharing applications should work will not come from large corporate stakeholders. Instead, he felt that any standards will come from "pure research, academe, or open source—as did the [Current] Web."

IMPLICATIONS

There are a few points we might take from this wide-ranging discussion. First, the Wireless Web, as a potential future iteration of the Current Web, may center on a multiplicity of devices, locations, and connections between users. This "any-to-any" power is currently evolving, and its future development may be driven by or depend on the development of new devices and applications that seem to provide value to users.

Second, because the Wireless Web is evolving, new opportunities may constantly appear for connection and interaction. In this sense, the Wireless Web is, and will be, incunabular—a place holder for something else, a future iteration rather than the "end model." Driven by new technology (in response to consumer demand for wireless mobility and functionality), change will be the status quo, heralded by the introduction of newer and better technology and capabilities. Users will have to accept this state and learn to harness its power as a perceivable benefit.

Third, despite its constant state of arrival, the Wireless Web may appear to provide enough stability to encourage multiple, transparent, and fully functional mobile interactivity between users and their devices. This is far different from the Current Web model, where users connect to many hard-wired servers one at a time.

Fourth, the increased number of touch points may promote connections and communications between and to multiple web devices. This may promote an increased ability for users to customize, filter, and access specific content as desired.

Finally, this new mobility (provided by an increased number of wireless devices), plus an increased potential for functionality (provided by the ability to access specific information in new and more personalized ways), may mean that increased communication and information-sharing opportunities become a part of daily life.

CONTENT CONSIDERATIONS FOR THE WIRELESS WEB

Whether it evolves from a server-centric or distributed model, the Wireless Web may continue the Current Web's ability to display rich media content: graphics, audio, and video, in addition to written text. As the Wireless Web evolves, partnerships between content and service providers may continue to drive demand for such capabilities.

On the other hand, for many users, the Current Web, despite its multimedia capabilities, is seen primarily as a print-like medium. Frauenfelder (2001) wrote about how "tech-savvy news junkies," frustrated with Current Web sites overloaded with tables, graphics, advertisements, and animation bogging down even the fastest Internet connections, are designing and using programs that strip away, or "debone," these features leaving just the written content. In a similar vein, display-space limitations in small, hand-held, wireless devices may position text as the predominant form of content. As a result, the ultimate acceptance of the Wireless Web may depend on the availability of content that has been scripted with the wireless device and end-user experience at the forefront of design.[8] Taking a

[8]Whereas Frauenfelder (2001) felt textual content is important, as long as it is stripped from other forms of content, Ullman (1997) pointed out that content as a whole is "worthless," nothing more than an excuse to click, to instigate a transaction (p. 50).

broader view, Yale professor Edward Tufte believed that content is anything displayed on a web page, and content may influence future iterations of the Web. "This is a content-driven business," according to Tufte. "Most of what happens in any information display depends on the quality and the relevance and the integrity of the content" (qtd. in Reinstein, 2000).

Based on these points, the demand for professional and technical communicators who can adapt information (content) for delivery to a multiplicity of wireless devices would seem to be high. What kinds of content might a Wireless Web require and/or promote? What sort of user interfaces (what users see on a display screen and how they interact with it) might promote the best interaction with this content? What skills might best equip students to produce such content?

Content

Ideally, content for the Wireless Web should be straightforward, easy to access, and easy to use. It should promote seamless connection and interaction across different platforms while answering the demand for mobility and functionality. No doubt, what we teach currently about producing effective content for the Current Web will continue to be valuable as we move toward the Wireless Web:

- Create content that the user wants. Meeting with focus groups, talking with representatives of the target audience, and listening to what users have to say should be considered essential research.
- Keep content simple. Feature the main point at the top. Make it easy for users to find the information they need. Provide simple processes for completing tasks.
- Keep content brief. Write succinctly; cut unnecessary words, but never sacrifice clarity for brevity. Include only the information specifically needed by users. Anything extra diminishes the effectiveness of the overall communication.
- Assure that the received message is the intended message. Provide feedback on errors or exceptions using clear, concise, and straightforward language. Focus any help or documentation on the users' task. Provide concrete steps for problem solving. Test everything before publication. Eliminate all mistakes, confusion, and other communication problems.

Interfaces

Likewise, general considerations for producing effective user interfaces for the Current Web will no doubt prove useful when designing for the Wireless Web:

• Provide ample navigation. Keep all needed options and information for a given task visible. Do not distract users with extraneous or redundant information. If users drill down to deeper levels, then provide a path back to higher navigation and content levels. Create navigation options that reflect users' tasks and/or information needs.

• Keep interfaces consistent. Navigation, terminology, tone, and style should be purposeful and consistent throughout the content. Choose or develop a content strategy and stick to it. Use language that the intended audience will understand. Use an understandable content structure. Present information carefully, thoughtfully. For example, proceed from simple, broad, general information to that which is more detailed, specific, and focused. Present more and more information as users drill deeper into the site.

• Integrate content and navigation well. Good integration of content with site design and information structure impacts website users' experience. Writers, user interface designers, and information architects should work collaboratively, and practice the skills of information organization and navigation. This makes the role of the technical communicator broader, more inclusive, and more responsible for the construction of user-centered websites (Bernard, 2000).[9]

Skills

The Wireless Web may demand new, different, and specific skills of those training to become effective communicators within its context. For example, technical communicators creating content for the Wireless Web may find additional challenges presented by the effective delivery of digital graphics, animations, streaming videos, and sound files to diverse wireless devices. There are some considerations.

First, consider the whole context of use. Despite its importance, content is ultimately only a part of the larger, more important user experience. Technical communicators must consider not only the display and usability of content on wireless devices, but also the whole context for its use outside the borders of that device, when planning and producing content for the Wireless Web. For example, lighting conditions, input methods, the time available to perform a task, the number of hands free to perform a given task, media support, and the size and weight of the device should all influence the design of effective user interfaces.

Next, provide ways of working with different user interfaces. It is doubtful that the Wireless Web will evolve along one standardized format. In contrast to the

[9]For more discussion regarding the connection between design and content organization in successful, user-centered websites, see Burdman (1999), Fleming and Koman (1998), and Nielsen (2000).

single, standardized technologies adopted by Scandinavia, Europe, or Japan, the United States currently supports multiple wireless communication technologies. Each has limited ability to interconnect with the others. Technical communicators might improve their abilities if they have some skills in conceptualizing how content might be repurposed for different target display platforms and/or user interfaces. Ideally, they would have the ability to conceptualize scripts that will travel with content and prompt different devices to create subsets of that content for a more consistent display. To better understand how to create such scripts, technical communicators may consider taking courses in basic HTML, XML, Java, JavaScript, and/or Perl programming. In addition, the effective delivery of web content to cellular telephones may require a working knowledge of Wireless Application Protocol (WAP), Wireless Markup Language (WML), and Wireless Telephony Applications Interface (WTAI). All are scripting languages designed to facilitate the access of text- and form-based web applications that can work effectively with a telephone's built-in functions. (Note that scripting languages change along with technology. As a result, the languages mentioned here may not remain the current standards. New languages may replace them and technical communicators should stay abreast of such developments.)

Also, provide different versions of any graphics. Because many of the devices associated with the Wireless Web will be mobile and small enough to carry in one's hand, any sort of display device they feature will of necessity be small: 160 × 160 or 240 × 320 pixels, or as little as 2.5 square inches, for example. Whereas text can automatically adjust itself to the available display space, images are not as flexible. As with the previous discussion of creating subsets of content with scripts, technical communicators may need to know how to create different versions of graphics (whether still or video) for different display devices. This may mean a working knowledge of scripting languages mentioned earlier, or experience with graphic production programs, or both. Working with either, one could produce different versions of the same graphic, each optimized for a specific and anticipated display platform and/or device.

Anticipate a limited amount of text. Small display devices may limit the amount of text that can be used. Some Wireless Web-enabled cellular telephones, for example, display only three or four lines (with 16 characters per line) of text at a time. As a result, readability is paramount when developing a content strategy for the production of web pages that can be accessed by wireless devices. Certainly, some considerations for the production of text for the Current Web are appropriate:

- Break text into chunks by using paragraphs, groupings, and subheadings
- Devote each chunk to a specific topic or idea
- Give users text they can scan

- Use text that clearly explains the content, purpose, or message of each page; say more with less.

Small display devices may call for communication through images rather than text. In such cases, technical communicators should be aware of the dynamics associated with visual rhetoric as well as of techniques for assuring that the intended and desired message match. Solid backgrounds in design, art history, visual communication, and visual design may be appropriate here. Additionally, it may prove useful to have a working knowledge of embedded technologies like Flash and Dreamweaver, which allow the creation and distribution of dynamic and interactive web pages incorporating text, graphics (still and video), and sound.

CONCLUSIONS

This chapter points to a number of different and viable change factors that suggest an evolution of the Current Web to a Wireless Web. Where the Current Web requires users to interact with computing devices that are generally confined to fixed locations, the Wireless Web may encourage users to interact with a multiplicity of hand-held devices from wherever they like. The Wireless Web may continue, even extend, the Current Web's focus on communication and information sharing, but may posit these activities within a transparent, seamless, fully functional mobile context that allows users to extend their communication and information-sharing activities into all aspects of their daily lives.

As a result, the Wireless Web may be a profound change agent for online communication and interactivity. Certainly, one aspect of such a change will be new forms or combinations of rich media content. Providing such interactive content to small display devices is a challenge and will surely engage the skills of future technical communicators. How to best prepare technical communicators to meet the challenges and opportunities of the Wireless Web is therefore a concern of technical communication educators.

Although no specific recommendations are made, or educational programs proposed, the discussion here does suggest a number of considerations for technical communication educators and students to consider. Specifically, many skills associated with producing effective content for the Current Web may be utilized for repurposing this content, or creating new content, for the Wireless Web. These skills include creating content that the user wants and can use to solve problems or derive benefits, keeping that content simple and succinct, and assuring that the received message of any communication matches the intended message. Technical communication educators can continue to incorporate the development of these skills in their service and/or degree programs.

Likewise, general considerations for producing effective user interfaces for the Current Web will no doubt prove useful when designing for the Wireless Web. Technical communication educators can teach students how to provide ample navigation, how to keep the user interface consistent, and how to integrate interface and navigation with visual design. As suggested earlier, these new conditions may place a new emphasis on audience analysis and identification. Knowing the audience and what they want may be paramount for successful communication.

Creating content for the potentially more dynamic and fluid contexts of the Wireless Web may require technical communicators to be skilled at the effective delivery of digital graphics, animations, streaming videos, and sound files to diverse devices. This suggests that technical communicators should have not only solid writing and editing skills, but also skills in visual design, visual rhetoric, and video and audio production. In addition, they may benefit from the ability to create scripts in several computer and/or wireless telephony programming languages. They may also benefit from the ability to work with embedded technologies like Flash and Dreamweaver, which allow the creation and distribution of dynamic and interactive web pages that can incorporate text, graphics (still and video), and sound.

In short, in addition to being talented writers and editors, future technical communicators may benefit greatly from solid backgrounds in design, art history, visual communication, and visual design, as well as skills in specific media production technologies and computer and/or wireless telephony programming languages. Should training in such skills be provided as part of technical communication service and/or degree programs? How much of each skill should a student be expected to know? Who should provide such training? And if students are to take the time to learn such skills, how might they be incorporated into technical communication programs?

Although it is beyond the scope of this chapter to offer answers to such questions, it is clear that the need for programs of study in effective technical communication should continue. Obviously, no one program can do and/or provide everything. Nor can educators be expected to possess expertise in all the skill areas already discussed. So, technical communication service and/or degree programs may want to develop their strengths. For example, educators may possess expertise in visual rhetoric, graphic design, or video production. Ideally, they should be encouraged to develop these skills and abilities and bring them to their academic program in the form of new courses or workshops. Certainly, the skills could be included in informal mentoring and advising situations. Concurrently, program administrators should encourage and promote the introduction of new teaching and learning opportunities, especially if they facilitate the overall program goals.

Both educators and administrators might seek ways to expand their programs by leveraging expertise in other areas. For example, programming courses might be taught as electives or as required courses by members of the computer science department. If a school maintains programs in electrical and/or software engineering, then such courses might be taught there.

Whereas electrical and software engineering may not be offered at every school, courses in art history, visual design, video and audio production are more common. Again, technical communication students might be encouraged to take such courses, either on an elective or required basis.

If departments are reluctant to offer more sections of a course in order to accommodate students outside their discipline, then perhaps individual faculty members could be persuaded to provide training through short seminars or workshops. Another opportunity might be to bring teachers into technical communication classes, either as guest presenters or coteachers. For example, a technical communication educator and her colleague from the visual arts program might together facilitate a class on the effective presentation of text and graphics.

Departments and schools offering service and/or degrees in technical communication might consider local employment opportunities for their graduates. Gauging who the potential employers might be and what skills they might wish in potential employees could help design more effective programs. For example, if a program sends its graduates into a community populated by telecommunication companies, then this might suggest that graduates should be skilled in principles of telecommunications and possess abilities to work with some of the scripting languages discussed earlier, in addition to being able to produce effective written and spoken communication.

Finally, we should remember the anticipated nature of the future Web—Wireless or not. Certainly it will be dynamic, fluid, nonstatic. Just as it will require new and different combinations of skills from technical communication students, so too will it make similar demands on technical communication educators. Teaching technical communication in the new millennium may require that educators embark on constant endeavors to upgrade and expand their skills. Educators may consider taking courses to gain expertise in some of the other skills areas discussed. For some educators, this will be an exciting opportunity. For others, it will be a threat. Faculty development is a problem currently encountered in many departments, and faculty and administrators must seek creative solutions. Like the Web of the new millennium, there will not be a final solution. The problems, and the opportunities, will be ongoing. So too will be the rewards.

In the end, it is improbable to think that any individual will have all the necessary skills and abilities in each of the areas outlined herein. It is not improbable, however, to think that any one individual will have both general and specific knowledge and abilities that can be combined with the skill sets of other technical communicators to solve the communication problems presented by the Wireless Web.

In this regard, collaboration, the skill and ability to work with others in order to leverage the diverse skills of multiple group members and achieve a desired goal, may prove central to any future teaching and learning of technical communication. The potential scenarios outlined here suggest that technical communicators may work productively in multitalented groups to produce the sort of content the Wireless Web may require. Technical communication educators and students, realizing these implications, may want to adjust their teaching and learning to take advantage of the challenges and possibilities afforded by the Wireless Web.

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6

Online Ethos and Intercultural Technical Communication: How to Create Credible Messages for International Online Audiences

Kirk St. Amant
Texas Tech University

The rapid spread of electronic communication technologies is quickly making the world a smaller place. As the economies of various nations become more intertwined, technical communicators increasingly find themselves designing materials for or interacting with a larger international audience. This audience, however, brings with it different expectations for how it evaluates and interprets information. For this reason, technical communicators need to become aware of cultural communication issues that could affect how international audiences might respond to their work.

This chapter uses the rhetorical notion of *ethos*, often defined as "credibility," to examine certain problem areas in international online interactions. Through this ethos-based approach, the chapter both examines why certain factors could cause miscommunication in international online interactions and provides strategies for avoiding these problems. The chapter also presents exercises technical communication instructors can use to familiarize students with aspects of cross-cultural communication. The chapter then concludes with an overview of online resources that professional communicators, instructors, and students can use to learn more about different cultural audiences.

A CAVEAT TO CULTURE AND COMMUNICATION

No culture is truly homogenous. Rather, each culture is made up of individuals who have their own unique ideas, opinions, and expectations. Yet, it is virtually impossible to interview all of the individuals in a given culture to determine how every member of that culture might react to the same situation. For this reason, intercultural communication research often presents information in terms of general patterns of how many of the individuals from a specific culture might act in a particular context. As a result, individuals who use this research as a foundation for planning cross-cultural interactions must remember that the information they are using only applies to general patterns of behavior, and interactions with individuals may vary from those general patterns.

For this reason, the information presented in the research on intercultural communication can serve as a foundation for how to interact with persons from other cultures. The key to effective cross-cultural communication, however, is learning about the individuals with whom one is interacting. Thus, cross-cultural communication strategies need to be modified over time as one learns more about individual clients and coworkers from other cultures. It is only through such modifications based on exposure and experience that truly effective cross-cultural communication can take place.

Within the context of intercultural communication research, the information presented here should be considered foundational—or general patterns of how cultural aspects affect communication. As a result, readers should view the information presented in the "Solutions and Suggestions" sections of this chapter only as a foundation for effective cross-cultural communication. It therefore becomes the task of the readers to use their interactions with individuals from other cultures to modify the cross-cultural communication strategies presented here. Only through such modifications based on experience can one develop a truly effective means of interacting in international online interactions.

THE INTERNATIONAL DIFFUSION OF ONLINE MEDIA

Whereas online use has been somewhat dominated by Western cultures,[1] the degree of international access to cyberspace is increasing with amazing speed. India, for example, has undertaken a series of governmental measures to promote the spread of undersea and underground fiber optic communication cables in order to get more citizens online[2] (*When India Wires Up*, 2000). The development of such a communications infrastructure has led to an economic boom in parts of India, such as Banglore (*When India Wires Up*, 2000). The People's Republic of China (PRC) has similarly undertaken strategies designed to increase online access, and the number of Chinese Internet users skyrocketed from 2.1 million users at the start of 1999 to 26.5 million users by June 2001 (Schauble, 2001; *Wired*

[1]According to one survey, roughly 50% of all Internet users are either from North America or Western Europe (*How Many Online*, 2004).

[2]The plan allows individuals interested in laying fiber optic cables to place those cables almost anywhere provided the individual covers the related costs (*When India Wires Up*, 2000).

China, 2000). Additionally, the United Nations has undertaken efforts to build "digital bridges" designed to bring more of Africa online[3] (*Tapping in to Africa*, 2000).

Western Europe has also experienced rapid growth in online communication, especially in terms of online business transactions. One report, for example, indicates that in 2000, nearly 466 Swedes, 685 Brits, and 1,800 Germans opened a new online brokerage account every day (*Going for Brokers*, 2000). Additionally, some 60% of German adults, 54% of adults in the United Kingdom, and 43% of adults in France are now online (*Measuring Worldwide Net Usage*, 2004).

This international spread in Internet use also brings with it new ways for thinking of international business practices and processes. Carliner (2000), for example, noted that the online environment has the potential to create offices and production facilities that remain open 24 hours a day, 7 days a week. In such a model, workers in one part of the world where the workday is almost over would use online media to send their projects to coworkers located in regions where the day was just beginning. Those coworkers could then continue to work on that project and use similar technologies to forward the project along to another part of the globe so that production would not need to stop just because the workday was ending in one location. Thus, one could use the Internet, in combination with international time differences, to create a production facility that never closed.

Interestingly, certain companies are experimenting with such international production practices. IBM, for example, has a project called "Java Around the Clock," which involves an international software production process similar to the one Carliner described. In this system, the programming process never stops. Rather, work is forwarded, via online media, to a new location where production can continue. The overall process starts in Beijing, China, and it is then sent to Seattle. From Seattle, the product goes to Belarus and to Latvia, then on to India, and finally, back to Beijing (Friedman, 1999). This production model, moreover, is only one of the ways companies could capitalize on the abilities of the Internet to make the world a smaller place. Consider, for example, the potential for outsourcing work to nations with skilled technical workers who can provide the same level of services for a fraction of the cost.

Such international online production models could affect technical communicators in one of three ways. First, the technical communicators generating documents associated with international online production models could find themselves using e-mail or other online media to interact with the technicians who are working on such a project. Because several of the individuals working on such projects would be located in different nations and be from different cultures, an understanding of cultural communication expectations could help technical communicators make the most of their online interactions with these persons. More-

[3]This "bridge building" includes a project to string 20,000 miles of undersea fiber optic communication cable around the African continent (*Tapping in to Africa*, 2000).

over, as international time differences mean that some individuals will be leaving work when the technical communicator is starting work, the asynchronous nature of online media such as e-mail could make it an easier and a more practical and cheaper method for interacting with international experts than international phone calls.

Second, technical communicators might find themselves involved in a similar kind of international online approach for creating documents. That is, the field of technical communication is not unique to just one country or region. The Society for Technical Communication (STC), for example, has active chapters in the United States, Canada, Europe, India, Israel, and Japan (*Around the World*, 2001). In many of these chapters, technical communicators are accustomed to producing user documents in the same language—English. As a result, document files could be forwarded to overseas coworkers just as easily as software programming code could. Thus, technical documents could easily be produced by international teams in which writers in one country forward work to international colleagues who will continue with the writing process. Alternatively, writers located in different countries—countries where the related technicians are located—could work on different parts of the same manual.

Such a process could require some editing to create a consistent style or tone for such an internationally generated document, but consideration must also be given to the purpose for which this document is being created. That is, if a company's goal is to get a new product (e.g., software) to a new international market as quickly as possible in order to gain a key share of that market, then delays related to producing accompanying documentation could counter the company's intentions. As a result, an international online production process might be the best method for achieving the company's goal of achieving an early product release into an important overseas market. As noted, one benefit of such an international document creation model is that some of the overseas technical communicators involved in such a document creation process might be located in the same area as the international technicians working on that project. In such cases, the ability to interact directly with those technicians could reduce the time needed to get information versus time delays associated with using e-mail to obtain prompt and detailed answers to multiple questions.

Third, technical communicators might find themselves participating in both of the aforementioned models—working on the same projects with both international technicians and with international technical communication colleagues. Again, the speed with which one's company wishes to get a product to market and the cost savings related to using well-trained overseas employees could influence how technical communicators are involved in the international online production of documents. For these reasons, it is becoming increasingly important that technical communicators understand pitfalls related to international online interactions.

ETHOS AND CULTURAL ASPECTS OF COMMUNICATION

Ethos, often defined as "credibility," is essential to effective communication. If an audience does not find a presenter credible, then that audience might ignore what the presenter has to say, regardless of the importance of the information being presented (Hager & Scheiber, 1997). In the field of intercultural communication, establishing credibility with individuals from other cultures can be complicated, because different cultures often assess credibility according to different criteria (Driskill, 1996). In many cases, however, technical communicators can use the rhetorical principles of Aristotle to solve credibility problems in cross-cultural interactions.

Aristotle suggested that speakers need to use their understanding of an audience's expectations to "become" credible speakers in the eyes of that audience. As Aristotle (1991) explained in his treatise, *On Rhetoric*:

> But since rhetoric is concerned with making a judgment (people judge what is said in deliberation, and judicial proceedings are also a judgment), it is necessary not only to look to the argument, that it may be demonstrative and persuasive but also [for the speaker] to construct a view of himself as a certain kind of person that hearers suppose him to be disposed toward them in a certain way and in addition if they, too, happen to be disposed in a certain way [favorably or unfavorably to him]. (p. 120)

Thus, Aristotle implied that for speakers to be perceived as credible by a given audience, they need to know what that audience's presentation expectations are in order to become the kind of speaker to whom that audience will listen.

A key example of how Aristotle's notions of ethos can help presenters establish credibility with other cultures can be seen in US–Japanese interactions. Many Americans[4] prefer direct explanations in which all of the related facts are stated (Hall, 1982). Conversely, many Japanese presenters[5] often appear to omit certain central facts, for in their culture, directly stating such "self-obvious" information is considered rude (Murdick, 1999). As a result of these differences, many Americans often consider the Japanese presentation style shifty and unfocused, because otherwise, they would get to the point more quickly. Many Japanese, in contrast, often view the more direct American presentation style as rude—the perception being that the presenter is treating the audience like children by stating all of the self-obvious facts related to the exchange (Murdick, 1999). In this example, each culture could see the other as lacking credibility due to cultural differences of what one should or should not say in order to appear credible in a given situation.

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[4]See the "A Caveat to Culture and Communication" section of this chapter.

[5]Again, see the "A Caveat to Culture and Communication" section of this chapter.

These cultural expectations of credibility, moreover, can take quite different forms.

A brief overview of intercultural communication literature reveals that cultural presentation aspects related to credibility can differ on a variety of levels. As Driskill (1996) noted, persons from different cultures often use different organizational structures for similar kinds of presentations. Such differences could furthermore occur between individuals from the same linguistic background (e.g., British and New Zealand writers vs. writers from the United States). Likewise, individuals from different cultures often use different argumentation strategies and appeals to sources when trying to create their credibility. As Hofstede (1997) explained, "Manuscripts written by German and French authors often present broad conclusions unsupported by data. Manuscripts written by British and American authors usually are based on extensive data analysis but present few conclusions" (p. 133).[6]

These cultural expectations related to credibility can occur at a microlevel as well. As Ulijn and Strother (1995) noted, cultures can have different expectations of sentence length, and these expectations sometimes affect how individuals from a culture perceive the credibility of a message: "A Southern-European client . . . might believe that the product is not a serious one because the sentences in the instructions telling how to use the product are too short" (p. 203). In other cases, Li and Koole (1998) and Li (1999) overviewed studies in which cultural differences related to the meaning associated with a particular word can cause intercultural communication problems. In both cases, the use of the word "support" caused credibility problems for Chinese and Dutch negotiators due to the different behavioral expectations each culture associates with that word.[7]

Although the rapid development of online communication technologies has brought with it increased exposure to other cultures, relatively little has been written on the effects these media are having on cross-cultural exchanges. There is, however, some evidence that cultural differences in presentation expectations persist even among younger or more educated individuals who are relatively "cyberspace savvy" (Artemeva, 1998; Ulijn & Campbell, 1999). In some cases, culture-based patterns of Internet use could also affect the perceived credibility of

[6]This notion is echoed by Weiss (1998), who examined how six different cultures (Mainland Chinese, French, Japanese, Mexicans, Nigerians, and Saudis) use six rather different methods of creating credible presentations. For example, "the Chinese tend to state a position, give a few examples, and then rest their case," whereas the French tend to appeal "to universal truths (experiences) and feelings and preferences (intuition), and . . . emotional intensity (élan)" (pp. 71, 79).

[7]In the case of the word "support," the Dutch tend to view this term as indicating a particular event, or instance in time—e.g., "I will support you with this (particular) undertaking." Many Chinese, however, can sometimes use this word to indicate that an individual is now a part of an "in-group" in which the group members work together to form a long-term relationship focusing on behavior that will help both parties in various circumstances that might arise over time. In such long-term relationships, often referred to as *Guanxi*, both parties work together for the mutual benefit of each other (Li, 1999; Li & Koole, 1998).

online materials. Thus, as worldwide online access increases, so does the potential for cross-cultural miscommunication related to credibility. The remaining sections of this chapter examine how verbal (text-based) and visual (image-based) aspects of online messages can lead to cross-cultural problems involving ethos.

ETHOS AND TEXT-BASED ONLINE COMMUNICATION

Online media such as web pages can contain both visual and verbal components, but it is often the verbal aspects, or written text, that contain the bulk of the information. As a piece of written text, these web pages are subject to the same kinds of problems inherent to any form of written communication designed for an international audience. Thus, the ethos expectations members of a culture apply to a traditional written text will probably also be used to evaluate online presentations that use text to convey information. Technical communicators, therefore, need to understand the major cultural factors that could cause their text-based work to appear less credible in the eyes of a given cultural audience.

Online message exchange systems, such as e-mail, are also text based and run the same risk of being seen as "noncredible" should the design of the electronic message contradict the cultural rhetorical expectations of the reader. Moreover, unlike web pages that tend to be directed to a rather large and somewhat "amorphous" audience, e-mails—and many other electronic messaging systems—allow the sender to direct messages to a specific audience or recipient. Such "direct" contact could make cultural rhetorical gaffes seem even more egregious, because mistakes could be perceived as a personal insult directed at a particular individual. For these reasons, the following section focuses on particularly problematic aspects of text-based communication: formality, identity, humor and ostentatious behavior, and the use of English as the language of interaction.

Formality and Credibility

Different cultures seem to expect certain levels of formality in relation to a professional interaction. Many languages, moreover, have verbal markers or tenses that are used to indicate the various levels of formality expected by a particular audience. The French language, for example, has a formal tense distinguished by the pronoun "vous," which is used to address someone who is older, is of higher status/stature, or is a new acquaintance, and an informal tense distinguished by the pronoun "tu," which is used with individuals one knows well and with whom one shares a relationship on a more personal level. Additionally, many of the French expect individuals to use certain formal structures in particular discourse situations. As Platt (1998) explained, when posing a request to a French person, one should use the magic words, "excusez-moi de vous deranger monsieur/madame" (excuse me for disturbing you sir/madam)—otherwise, the speaker runs the risk of being perceived as rude. Failure to acknowledge and to communicate according to these expectations of formality could lead to accidentally insulting an individual from this culture.

Cultural expectations of formality also seem to apply to business-related communications. French business letters, for example, tend to be very formal. As a case in point, one French-language writing text encourages readers to begin standard business letters with phrases such as:

> J'ai le plaisir de poser ma candidature au poste de . . .
> (I have the pleasure of posting my candidature for the position of . . .)
> Permettez-moi de soumettre ma candidature au poste de . . .
> (Permit me to submit my candidature for the post of . . .)

The text also encourages readers to end business letters with equally formal phrases such as:

> . . . l'expression de mon respectueux dévouement
> (. . . the expression of my respectful dedication/devotion)
> . . . l'assurance de mes sentiments les plus distingués.
> (. . . the assurance of my most distinguished sentiments) (Simard, 1998)

Furthermore, this situation is not exclusive to French culture; rather, many cultures expect certain levels of formality at all times—especially in relation to business or professional interactions. In these cases, if the expected level of formality is not used in a message, the recipient might not consider the sender as a "credible" source and thus ignore the information being presented.

Other cultures, however, appear to have less rigid expectations related to formality, especially in online communication. Many Americans, for example, might consider the writing style of a French letter overly formal or even stilted. However, French readers who have been trained to write in this format might view less formal presentations, such as marketing e-mails, as rude, crass, or noncredible, especially as there seems to be some indication that these expectations of formality carry over into the online environment (Watts, personal communication, September 20, 1999). Moreover, studies reported by Kiesler, Siegel, and McGuire (1984) and by Hiltz and Turoff (1993) indicate that formality breaks down online. Additionally, Warnick's (1998) research suggests that the speed and the tenacity of the response—concepts often antithetical to formality—often become markers of status, and thus credibility, in online exchanges. Cultural differences related to formality could thus cause problems in international online interactions.

Strategies and Solutions. To avoid potential insult related to expectations of formality, one can adopt three key strategies:

- Use a formal tone when communicating with individuals from other cultures, especially when communicating with new acquaintances or superiors.
- Avoid using given/first names when addressing someone from another culture. Rather, include titles such as "Mr." or "Ms." or "Dr." Ideally, technical communicators designing materials for other cultures will learn the titles of respect in a given culture and then use those titles when communicating with persons from that culture (e.g., Herr Schmitt, Tokida-san, Madame St.Onge, etc.).
- Do not use an individual's given/first name until that individual gives you permission to do so. Just because someone from another culture addresses you by your given/first name, that behavior does not necessarily mean it is acceptable for you to address that same individual by his or her given/first name. Rather, in many cultures, superiors address subordinates by given/first name, but subordinates are expected to use formal titles when interacting with those same superiors.

Teaching Tips. To help students better understand cultural expectations related to formality, technical communication instructors can use the following two-part assignment:

- Part I: Assign students the task of drafting an e-mail for a coworker from a particular culture. As a part of the assignment, require students to locate specific reference materials on the particular culture and use these resources to develop an understanding of the expectations a culture might have in relation to formality.
- Part II: Have students locate someone who is from the same culture researched in Part I. That person should read and evaluate the e-mail to determine if it might be considered too formal or too informal by individuals from his or her culture. Such a review process can help students grasp how different cultural expectations and interpretations of formality can affect perceptions of online messages.

Identity and Credibility

In some cultures, the lack of a discernible identity can contradict communication standards used by that culture. In parts of the Middle East and parts of Eastern Europe, for example, communication often involves interacting with others through relatively large and complex *social networks* (Hofstede, 1997; Richmond, 1995). These social networks, in turn, are often based on the trust formed by long-term relationships developed between individuals over time or by strong familial ties and senses of family duty and family honor (Condon, 1997; Hoftstede, 1997; Richmond, 1995; Weiss, 1998). In these cultures, being able to interact with or be "heard by" a certain individual, especially someone in a position of power, is not so much a matter of gaining access to that individual as it is being introduced to that individual by the "right person" (Hofstede, 1997; Richmond, 1995; Scharf & Mac Mathúna, 1998; Weiss, 1998). In such cases, what makes presenters credible, or worth listening to, is their identity in relation to the overall social network with which the audience is familiar.

In cultures that use these social network systems, individuals often review or ignore a message based on the identity of the speaker (Hofstede, 1997; Richmond, 1995; Weiss, 1998). If the information comes from someone the audience knows and trusts, then it is considered valid; if the information comes from an unknown source, then it is viewed with suspicion. Thus, in cultures where social networks are valued, identity is of paramount importance, because the identity of the speaker can have the greatest influence over how the listener will view a message.

Research in online communication, however, indicates that online media often reduces human interaction to words and removes many of the nonverbal cues related to an individual's identity (i.e., race, gender, socioeconomic status, etc.). This relative anonymity allows many users to "re-create" their online identities as whatever they desire. In fact, some online news groups use this potential to "create your own identity" as a selling point (VanGelder, 1990).

This online anonymity, however, has its drawbacks. For example, in cyberspace, the notion of authorship, or who wrote a particular message, is often blurred by the "re-posting," or forwarding, of online messages. So, when individuals receive an online message, they may re-post it to a number of individuals. Any one of those individuals may re-post that message to any number of other persons. Yet the plasticity of electronic messages allows individuals to cut and paste only portions of a message and thus present items out of context. Similarly, this plasticity of medium allows posters to modify an online communiqué by inserting new text into that message or deleting existing text from that message (Warnick, 1998). As a result, one person could easily alter what another said and thus alter that person's identity/who that person is by "putting words in that person's mouth." Individuals posting messages can also create a new sense of identity for themselves by copying the words or ideas of another but not giving credit to the original source.

Similarly, the ease with which one can copy online materials makes it relatively simple for "pranksters" to create "gag" websites that look like an actual recognized and respected site but that contain false information. Thus, just because a given website "looks" professional does not necessarily mean that it "is" credible. Again, the situation is one of anonymity and identity. The plastic nature of electronic media means that traditional markers of identity such as an official logo or a particular stamp or seal of authenticity can easily be copied and attached to "unauthorized" online information. Under such conditions, then, how does one determine the true identity of the author of a given website? Furthermore, under these conditions, what markers should the designers of "credible" websites use to appeal to international audiences who consider identity the hallmark of credibility? As a result, the relatively anonymous nature of the online environment could mean that individuals from certain cultures might ignore or dismiss any "anonymous" online information.

Strategies and Solutions. Because identity can be very important to successful interaction with individuals from other cultures, technical communicators need to make sure their identity and the identity of their related company is known if they wish to create effective online materials for international audiences. These communicators also need to make sure they are introduced, electronically if possible, by the "right person"—generally an individual who is known and considered credible by members of a given social network. Establishing online identity can be difficult, but the following steps can help individuals meet the identity-related criteria that are often essential to creating credible online messages:

- Begin initial online correspondences with an introduction that states who the author is; such an introduction should include the writer's full name (given and family name), job title/position, and the company for which the author works (e.g., My name is John Smith, and I work in the Marketing Department at This Company, Inc.).
- Use an e-mail address or a URL that contains a corporate name (e.g., use JaneDoe@GeneralMotors.com instead of JaneDoe@aol.com or www.GeneralMotors.com vs. www.marketing.information.com). The use of such corporate identifiers further solidifies one's identity as a member of a given corporate organization, and not a random individual with an e-mail account or a web page.
- Use tag lines containing one's name, position in the company, and company name for every online correspondence with individuals from other cultures. The use of such a tag line further reinforces one's identity as an individual and as a part of a corporate organization.
- Make sure that web pages designed for international audiences clearly and directly present the identity of the company sponsoring the website.
- Make sure that such web pages also contain ample contact information, such as regular mailing address, phone number, and e-mail addresses. This kind of information allows the international user to verify the source or the identity of the individual presenting information via that web page.
- Make sure to answer all queries in a timely manner (ideally, within 24 hours from the time of receipt) to confirm that a site's contact information is valid. Delays in responding could be considered suspect behavior. Even if the requested information cannot be provided right away, respond with an e-mail confirming

that the sender's message was received and noting that a response to the query will follow.

• Make sure all online and hard copy data match and that all online data is current, because incompatibility among sources of information could cause international clients to doubt the credibility of online information. Also make sure that all links are working and current so that international clients do not attempt to access nonexistent materials. As E. T. Hall and M. R. Hall (1987) explained, for some cultures, a single instance of failure can be all it takes to destroy one's credibility, and once gone, such credibility can be difficult to reestablish.

• Target specific cultural audiences by linking the company to a particular cultural-historic event, thus inserting the company into a given cultural network system. For example, in an online site designed for Ukraine, have the splash/introductory page of the site reference what the related company has done for/in Ukraine in the past. This appeal to a common historical bond between company (writer) and audience (reader) can help place the company into a particular social network recognized by a particular culture. Such placement, in turn, can give that company credibility in the minds of that audience.

Teaching Tips. To help students understand the importance of cultural associations with identity and credibility, as well as understand problems created by the anonymous nature of cyberspace, technical communication instructors can use the following three-part assignment:

• Part I: Divide students into groups of 3–5 and then have each group select a particular target culture it wishes to research online. Make sure that each group selects a different culture. Groups should then create a website for the particular cultural audience it has selected; such a site would consist of a splash page and perhaps 1 or 2 pages linking off of that splash page.

• Part II: After each group has designed a splash page, have group members locate 3–5 web pages designed by individuals from the related target culture. Groups should analyze each of these target culture web pages for how they establish the identity of the organization they represent. Groups should compare the identity-creating strategies used in each of these target culture pages to determine if there are any recurrent patterns that a particular culture appears to use to establish online identity.

• Part III: Once groups establish cultural patterns for creating online identity, each group should use the identity patterns observed in Part II to create a second/revised online site designed for that cultural audience. Again, such a site should include a splash page and perhaps 1 or 2 pages linking off of that splash page. Have each group present the two websites—the initial site designed based on assumption and the second site designed according to research—and explain how the differences between the two sites could affect perceptions of those sites.

Humor and Ostentatious Behavior

Research in computer-mediated communication (CMC) reveals that factors contributing to a "credible" presentation often change in the online environment (Sproull & Faraj, 1997). As Fernback (1999) noted, in CMC, the marks of status—marks that could draw others to listen to you—are not, "brawn, money, or political clout," but rather are, "wit, and tenacity, and intelligence" (p. 213). This notion of humor and wit contributing to one's online ethos has also been noted by researchers such as Baym (1997) and Warnick (1998). As both Baym and Warnick explained, individuals who are "quick on the draw," or witty, tend to be viewed more highly than those who are more passive. Moreover, repeated quick and witty responses over time allow individuals to build up a kind of online credibility, or ethos. As a result, their opinions and viewpoints tend to be listened to more often and tend to be accepted more readily than those individuals who post less often or with less wit or verbal zeal.

Axtell (1999) and Hu and Grove (1999), however, noted that what is considered humorous or witty can vary greatly form culture to culture. Axtell (1999) explained that individuals from different cultures seem to have different opinions of the kind of humor they prefer. Many Egyptians, for example, seem to prefer political-based humor. Many Danes, however, appear to favor humor based on heavy sarcasm (Axtell, 1999).

The kinds of topics considered valid for joking or poking fun at can also vary from culture to culture. Many Americans, for example, might think it appropriate to joke about one's boss or one's company, yet many Chinese might consider jokes about such topics distasteful or uncouth (Hu & Grove, 1999). Similarly, many Americans often feel comfortable joking about their own family members. In much of Mexican culture, however, the family is often considered of the utmost importance, and making fun of an individual's family could be considered offensive (Axtell, 1999; Condon, 1997; Tebeaux, 1999).

Furthermore, different cultures have different expectations of when it is appropriate to use humor in a professional context. Many Czechs and Slovaks, for example, take business interactions seriously and joke after, not during, a business transaction. Richmond (1995) pointed out, "They do not appreciate the American habit of cracking jokes and making humorous comments during business meetings" (p. 89). As a result of such differences, uses of humor in international online documents could inadvertently result in miscommunication or offense. Thus, factors that appear to contribute to one's online credibility could cost one ethos when engaging in international online interactions.

In other cases, the showiness of one's online behavior could cause cross-cultural credibility problems. Americans have an international reputation for "ostentatious" or "showy" behavior that often borders on hyperbolic (E. T. Hall & M. R. Hall, 1987). This American predisposition to emphasize "the best," "the greatest," or "the most excellent" seems to permeate many forms of communication, from advertisements to resumes. However, as Hofstede (1997) pointed out, such appeals to individual greatness are not necessarily shared by or appreciated by individuals from other cultures. Hofstede also noted that these cultural differences related to ostentation could have unexpected negative results on cross-cultural communication practices. This cultural notion of the hyperbolic display, moreover, seems to have important implications for creating online credibility.

In online interactions, individuals sometimes attempt to create their credibility by emphasizing their technical knowledge and by displaying their scorn for the less "cyber savvy." Warnick (1998), for example, noted one study in which the more technically adept members of an online list used metaphor, disassociations, and model-based argument to reveal their own competence and to create a sort of exclusionary and patronizing tone toward the less knowledgeable users on the list. Baym (1997) commented on similar displays of personal knowledge used to establish one's online credibility—especially if such displays provide information that can help group members better evaluate current discussion topics.

This use of ostentation to gain online credibility, however, could cause cross-cultural communication problems. Hu and Grove (1999), for example, explained that the Chinese culture's emphasis on humility often means that many Chinese avoid behavior that could be perceived as bragging or arrogance—a behavior pattern that contradicts Warnick's (1998) observations that showing off one's "cyber competence" can be used to establish online credibility. Such differences could lead each side to have skewed views of the other. As Hu and Grove (1999) put it, "What seems flexible and non-aggressive to an American may be perceived as selfish and overly assertive to the harmony-loving Chinese" (p. 127). Thus, online messages that openly or aggressively promote a particular individual, company, or product could lead to varying international perceptions of that individual, company, or product.

Strategies and Solutions. Fortunately, intercultural communication problems related to humor and ostentatious behavior can be avoided through four simple strategies:

- Avoid jokes or other kinds of humor in all forms of online communication (e.g., e-mails, web pages, etc.) because it can be very difficult to determine what members of one culture might or might not find humorous.
- Avoid using hyperbole (e.g., "The greatest accounting software in the world!!") to advocate a particular company, service, or product.
- Avoid using superlatives unless necessary to comprehension, and avoid drawing attention to the achievements of a particular individual unless such a reference is directly related to the subject being presented at that point.
- Determine what might constitute "ostentatious" behavior in a specific culture by reviewing several online sites created by individuals from that culture. In

such a review, focus on related kinds of materials. For example, if designing online help, then find an online help site designed by an organization or individual from that culture. Should no such similar materials be available, consider using advertisements or promotional materials to get a feel for the style of promotion expected by individuals from that culture.

Teaching Tips. Different cultural ideas of ostentatious behavior might be difficult for students to grasp. One way to help students understand this important cultural notion is to use a three-part exercise that requires a simultaneous comparison of several different cultures:

- Part I: Have students do online searches for the web page versions of widely read periodicals and newspapers from at least three different cultures; make sure that one cultural audience is the students' own culture. Have students skim these materials to locate advertisements and articles that address the same kind of topic, such as automobile advertisements, shoe advertisements, and so forth. Require students to find 3–5 advertisements or articles from each of these cultures.
- Part II: Have students draft an analysis of how the examples they have found from each culture address the topic of "ostentation." For example, how "showy" is the display? What features make it "showy"? Have students use this analysis to draft tips for designing ads for individuals from each of these three cultures.
- Part III: Have students use the tips they have drafted to design two different kinds of online sites. The first site should be a general international site that members of all three cultures would use. The second site should be a series of culture-specific sites: That is, students should design three different culture-specific sites—one for each of the cultures they researched. Students should then give a presentation explaining what makes each kind of site successful in terms of the expectations of its related audience(s).

English as the Language of the Exchange

English has rapidly become the international language of science, technology, and business. With 1.6 billion speakers, it is also one of the most widely spoken languages on earth (Fishman, 1998–1999). Yet, the fact that individuals "speak" English does not necessarily mean that they speak English well or that they understand all of the subtle nuances and intricate uses of the language (Katzenstein, 1989; Rodman, 1996). Certain geopolitical and economic factors have greatly affected the nature of English-language instruction in other nations. Some of the more common problematic factors include limited access to native English speakers, limited access to good teaching materials, and limited access to effective and competent instructors (Katzenstein, 1989; Rodman, 1996). Even for those persons who have studied English for a number of years under an effective educational system, certain linguistic nuances could contribute to cross-cultural confusion when English is the language of an exchange (Axtell, 1999). Furthermore, there are various dialects of English used around the world. Although these dialects are often quite similar, there are still enough areas of difference (e.g., idioms, different terms used to name the same item, and different uses for the same term) that certain kinds of communication problems could occur (Crystal, 1995). As a result, writers need to be careful when designing online English-language materials for international audiences.

Strategies and Solutions—Linguistic Issues. The following strategies can help technical writers create more "user-friendly" English-language materials for an international reading audience:

- Avoid idiomatic expressions. Idiomatic expressions are word combinations that have a specific cultural meaning different from their literal meaning. For example, the idiomatic expression "It is raining cats and dogs" does not mean that cats and dogs are falling from the sky like raindrops (the literal meaning of the expression). Because the meaning is based on a particular cultural association, English as a Foreign Language (EFL) speakers often have no way to know that such expressions convey nonliteral meaning unless someone has made them aware of that meaning.
- Avoid abbreviations. Abbreviations are like idioms, because they rely on a particular cultural background to understand what they mean. Thus, when using abbreviations, spell out the actual term the first time the abbreviation is used and use some special indicator to demonstrate how this abbreviation relates to the original term or expression. For example, "This passage examines the role of the *R*oyal *C*anadian *M*ounted *P*olice (RCMP)."
- Avoid using complex verbs or long noun strings. If more than one verb is used in a sentence, EFL speakers with a limited knowledge of English might have problems determining what the actual action of that sentence is. For example, in the construction "do tell," is the action of the sentence "do" or "tell"? The more verbs used in creating a verb construction (e.g., "could have done"), the more difficult it could be for new EFL speakers to discern the action of the sentence. A similar process could occur with long noun strings that could make it difficult for the new EFL speakers to identify the actual subject of a sentence. Consider for example the complexity of identifying the subject of the sentence, "A light particle flux time series is the subject of this paper" (Jones, 1996).
- Know the dialect of English spoken by the target culture. Although the major dialects of English are quite similar, there are areas in which they differ, and these differences could result in comprehension problems. Speakers could use different terms for the same object or concept; for example, American mechanics use "wrenches" to change a car's "battery," but their British counterparts often use "spanners" to change "accumulators." Similarly, speakers of different di-

alects could associate different meanings with the same term; in many dialects of English, the word "bold" means "courageous"; yet in Irish English, the word "bold" is often used to mean "naughty" (Crystal, 1995). Various dialects of English can also have different idiomatic expressions not recognized by speakers of other dialects, such as the South African "Where he'll do it," which actually means "He certainly won't do it" (Crystal, 1995). Also different dialects could have different spellings for the same word, such as "color" versus "colour." For this reason, technical writers should identify the dialect of English spoken by their audience and either familiarize themselves with potentially troublesome expressions or have a native speaker of that dialect of English review documents prior to publishing/posting them.

A discussion of cultural differences in relation to language should also include a discussion of how individuals from various cultures might have different ways of representing numeric information. Representations of dates, times, and magnitudes can all vary along cultural lines and could result in cross-cultural communication problems (St. Amant, 1999). In some cases, the individuals interacting might speak the same dialect of English, but might present numeric information in different formats—those of their native cultures. In other cases, individuals might be from different English dialect backgrounds, and thus might present numeric information according to different norms related to those backgrounds. Table 6.1 presents an overview of various numeric problem areas in international exchanges. It also provides solutions and strategies for avoiding such number-based problems. By taking certain steps, technical writers can help ensure the numeric information they present to international audiences is correctly understood.

Teaching Tips. Helping students understand the subtle differences in various English dialects can be entertaining but difficult, because many dialect differences could be too subtle to detect directly. For this reason, the following exercises try to foster a general understanding of these linguistic differences:

- Exercise I: Have students locate two different English-language websites or help sites that provide instruction on how to perform a particular task. Each site should be designed by individuals from a different English dialect background, and these materials should address the same process or topic. Next, have students read through the two sets of materials and circle, underline, or highlight any apparent disparities such as numeric representations, unknown words, words used in a "different" context from what students expected, or unknown expressions. Have students then discuss how the differences they have found could cause communication problems when members of these two different dialect groups interact.
- Exercise II: Have students draft a set of online English-language instructions/ online help according to their native dialect of English. Then, have students locate

TABLE 6.1
Numeric Representations

Problem Area	*Reason for Problems*	*Strategies and Solutions*
Dates	Some cultures represent written dates in the order of the month, the day, and then the year (e.g., April 1, 1998, becomes 4-1-98), whereas other cultures use a similar format but place the day before the month (e.g., 1 April 1998, which is represented numerically as 1-4-98). These differences can result in problems if members of these two cultures use numbers to signify a meeting date, a production deadline, or a shipping date.	When presenting dates, spell out the name of the month. For example, dates written as January 1, 1999, and 1 janvier 1999, avoid confusion over what number represents a day and what number represents a month.
Times	Some cultures tell time according to a 12-hour clock. Other cultures, however, tell time based on a 24-hour clock (e.g., 1:00 p.m. becomes 13:00, 2:00 p.m. becomes 14:00, 3:00 p.m. becomes 15:00, etc.). The various cultural representations of time can cause confusion or result in readers misinterpreting the meaning of a particular piece of numeric data.	Let the reader know what system of time representation is used in the document. For example, begin documents with phrases like "This document relates time based on a 24-hour clock, which with 0:00 represents midnight and 12:00 represents midday."
Magnitudes	Many cultures use different punctuation markers to indicate certain kinds of magnitude: in the United States and Canada, commas usually denote thousands (1,000), millions (1,000,000), or billions (1,000,000,000), whereas Germans use a period instead of a comma to indicate thousands, millions, and billions (one thousand = 1.000 and one million = 1.000.000).	If designing information for a specific cultural audience, use the magnitude format preferred by that audience. Begin messages for general intercultural audiences by stating the system of magnitude representation used in the message. Be sure to discuss orders of relative magnitude (e.g., 1,500 = one thousand five hundred, and 1.500 = one and one half or one point five).
	Also, different cultures sometimes use the same punctuation to indicate different scales of magnitude. Americans use commas to indicate magnitudes of one thousand or greater and periods to indicate magnitudes smaller than one (one thousand five hundred = 1,500 and one and one half = 1.500). The French use the reverse of this system of punctuation so one thousand five hundred is 1.500 and one and one half is 1,500. Such differences could cause cross-cultural confusion.	Restate the system of magnitude representation at the beginning of each section containing magnitudes. This repeated referencing ensures that the reader will correctly interpret information.

an online dictionary or other web resource that compares their dialect of English to another dialect of English (e.g., a US–UK English dictionary). Using this reference source, have students review their original instructions/online help and locate any dialect differences as noted by the reference source. Based on this review, the students should use the reference source to try to re-draft their instructions in a more "dialect neutral" tone—a way that members of both English-dialect groups could easily understand. After completing a final draft, students should engage in a class discussion of the kinds of problems they had and the kinds of differences they noted in writing their instructions. Through this discussion, students should try to develop a list of "tips" or "strategies" to employ when creating a single set of English-language documents for the world's various English speakers.

- Exercise III: Have students locate a particular set of online instructions or an online technical article. Next, have students use the tips mentioned in Table 6.1 to revise the instructions, description, or article for an international reading audience. After students complete their re-write, have them discuss the number and the nature of the changes they made.

ETHOS AND IMAGE-BASED ONLINE COMMUNICATION

Images can contribute to the online communication process in many ways. They can help with understanding by providing examples of what something should look like or help with instruction by providing examples of how to perform a particular process. In international communication, images could also mean a reduction in translation costs as they can reduce the amount of text needed to present information. Individuals from different cultures, however, can have different expectations for how visual information should be displayed or can associate different meanings with the same visual element. Failure to understand these differences could accidentally lead to confusing or offensive messages that might jeopardize the credibility of an online presentation. Technical communicators should therefore keep certain aspects in mind when designing online visuals for international audiences.

Problems With Images as Examples

Whereas images can provide examples of specific items, the same item can have a very different appearance depending on the country in which the reader is located. Mailboxes, for example, can have different features depending on the country in which the mailbox is located. In much of the United States and Canada, the stereotypical mailbox is a rectangular "box" that sits atop of a post. In other nations, however, a mailbox might be a small door in a wall or a cylindrical metal structure.

Such differences have implications for online icon design, especially if something such as a "mailbox icon" is used to indicate an online mail option (Gillette, 1999; Horton, 1993). As Gillette (1999) explained, "A mailbox icon used to indicate 'send mail' in the United States may just look like a blue box to the international visitor" (p. 17).

The linguistics concept of prototypes offers technical communicators one method for understanding and working effectively with these culture-based differences. According to prototype theory, humans use a concept known as an *ideal* to classify the objects that they encounter in the world around them. These ideals act as representations of overall classes of objects and are formed by exposure over time—that is, the more you see a sparrow over the course of your life, the more likely you are to consider a sparrow as an ideal representation of what a bird should look like (Aitchison, 1994). Each ideal is made up of a series of traits or *characteristics*, and these characteristics serve as criteria for defining what traits an item needs to possess in order to be considered a member of a particular class of objects (Aitchison, 1994).

Whenever individuals encounter something new, they compare the characteristics of the new object to the characteristics of the different ideals in their mental database of categories (Aitchison, 1994). For example, one person's ideal representation of the concept of "bird" might be "sparrow"—that is, in the individual's mind, a sparrow is an ideal example of what a bird should be. The characteristics that make a bird a bird, then, are defined in terms of the characteristic traits of a sparrow. As a result, whenever that individual encounters a new object, the person will attempt to determine if that object is a bird by comparing it to this personal ideal for a bird—a sparrow. If the new object has many of the same characteristics that a sparrow does, then that object will probably be classified as a bird. If the object does not have many characteristics similar to a sparrow, then the object will be considered a "non-bird." Under this characteristic-based classification system, the more something resembles an ideal, the more likely it is to be identified as a particular type of object.

As noted, ideals are based on exposure over time. Natural or cultural differences among nations and regions, however, often mean that persons encounter different kinds of objects. Persons from different cultures could therefore have developed different ideals for the same classes of objects. Such differences could, in turn, result in individuals identifying the same item as belonging to a different class of objects. As online materials are accessible to a wide international audience, technical communicators need to make sure that users from different cultures can correctly identify visual items.

Strategies and Solutions. When creating images for international audiences, technical communicators can follow a few basic steps to avoid confusion:

- Avoid assuming that what is a standard, or "ideal," image for one culture is a universally recognized one. Rather, initial research should be performed to deter-

mine what constitutes an "ideal" of a particular object in a specific target culture (the cultural audience for which the image will be designed).
Then, in order to perform such research:

- Review multiple examples of the same kind of item as portrayed by individuals from that culture. The first example a technical communicator encounters might not be the prototype example of an item in that culture. For this reason, technical communicators should find several examples of the same item in order to make sure they have an accurate understanding of what constitutes the ideal of that object in that culture.
- Identify the defining characteristics of the representation once a particular cultural ideal has been established. Knowing what characteristics define a particular ideal can help technical communicators make sure that the image they create will be correctly identified by the particular target audience. This characteristic-based information can also provide technical communicators with the information needed to create variations on a similar theme. For example, technical communicators can increase the chances that a target audience will correctly identify an abstracted representation of a particular item provided that abstraction has enough characteristics in common with a particular ideal.
- Use a sample audience to test final images prior to releasing them for general use. Ask members of the sample audience to identify what the image is and what characteristics help them identify that image. If the sample audience fails to identify the image correctly, then ask them to provide a list of characteristics that could have helped them identify that item. Such a final review can help technical communicators make sure they have designed an image that the greater cultural audience will correctly identify. Such a listing of characteristics can help technical communicators better modify images to meet cultural classification expectations.

Teaching Tips. Prototype theory can be a powerful tool for helping students understand how cultures recognize certain images. The following two-part exercise uses prototype theory to examine cultural expectations related to images:

- Part I: Have students select three kinds of products they wish to use as the focus of a web page designed for international audiences. Next, have students identify a particular culture, and then review multiple online sites created by members of that culture. In this review, students should identify images of the products they have selected for their own website. Instructors should require students to find 3–5 examples of each kind of item to make sure the cultural representations students locate are more generally recognized ones and not a "fluke" presentation.
- Part II: Use the review process in Part I to have students determine what the "ideal" representation of a given item should be. Similarly, have students list the

"characteristics" that help members of that culture identify that ideal. Next, have students use this list of characteristics to design two kinds of culture-specific, online images—one that is lifelike and one that is more abstract. Students should then present these two images to the class and explain what the key characteristics of the related ideal are and how these characteristics are embodied in each of the two images.

Depictions of People

The depiction of people is, perhaps, one of the more volatile areas of international image design, for cultures can have different expectations of what is considered an appropriate representation of a human being. For example, the way individuals in an image are dressed and how covered their bodies are needs to be carefully considered because certain dress styles can be culture specific and could convey unintended messages (Andrews, 1998). As Condon (1997) noted in his studies of Mexican–US relations, in some cases, dress can indicate different aspects of social status depending on the culture of the viewer. In other situations, dress can indicate one's attitude toward another culture. In many parts of Japan, for example, it is traditional for individuals, especially visitors, to wear a jacket to a business meeting and to keep this jacket on until the Japanese host removes his or her own jacket. To many Japanese, such a gesture is considered a sign of respect (Varner & Beamer, 1995). An image depicting individuals in their shirtsleeves while a Japanese counterpart is still wearing a jacket, thus, could be interpreted by some Japanese viewers as a sign of disrespect and could inadvertently send a message that the related company does not respect Japanese culture or traditions.

What people are doing in images can also cause problems by conveying various nonverbal information to different cultural audiences. Cultures, for example, often have different notions of a "comfortable distance" for communication. In much of Middle Eastern culture, it is common for speakers to stand relatively close together when talking, and attempts to keep one's distance from someone who is speaking to you could be perceived as rude or lofty behavior. Conversely, many Japanese individuals seem to prefer a relatively sizable distance between themselves and the person to whom they are speaking. In this case, attempts to close that distance could be perceived as "aggressive behavior" (Bosrock, 1994; Hall, 1982; Varner & Beamer, 1995). Similarly, physical contact can mean different things from culture to culture, because although members of many Western cultures probably associate adults holding hands with romantic intimacy, in parts of the Middle East, men who are good friends commonly hold hands to indicate those close bonds of friendship (Lustig & Koester, 1999). Thus, the positioning of individuals in a given image can have different connotations to individuals from different cultures and can lead to unexpected interpretations of the relationship depicted in an image.

The gestures used by persons in an image can also have a different meaning depending on the culture of the observer, because the same gesture can have different meanings in different cultures. For example, the "thumbs up symbol" that has positive connotations in the United States is considered a gesture of insult and offense in parts of the Middle East (Axtell, 1999). Moreover, these different cultural associations with gestures have had negative political and economic consequences in the past. In the 1950s, for example, then Vice-President Richard Nixon inadvertently offended many Brazilians when, on a state visit to Brazil, he curled his finger and thumb into the classic American "OK" gesture before a group of reporters and photographers. In this case, in Brazil, that gesture is considered a highly offensive one (Axtell, 1999). Similarly, the failure of the American-made Monza automobile in the Greek market might have been related to an advertising campaign that featured a spokeswoman holding out her palm in the standard American gesture for stop, which is also a highly offensive Greek gesture that "may provoke violence from the insultee" (Berlitz, 1982, p. 96).

In other cases, aspects of gender can affect the success of images designed for international audiences. This is because different cultures can have different expectations of how women and men are expected to dress, how women and men are expected to interact—both in public and in private—and what kinds of activities are "acceptable" for women and men in that culture to perform both in public and in private (Andrews, 1998; Hager, 2000; Neuliep, 2000). As Neuliep (2000) explained, "In virtually every culture, men and women dress differently and in many cultures, the difference begins at birth" (p. 254). Andrews (1998) similarly pointed out that these cultural expectations related to gender can greatly influence whether or not the members of a particular cultural group consider an image acceptable or distasteful. Online materials that fail to recognize these gender-based cultural expectations could thus inadvertently offend certain international audiences and cause related materials to appear "non-credible."

Strategies and Solutions. By using certain strategies, technical communicators can avoid many of the problems related to depicting humans in images designed for international audiences. It should be noted that the following strategies and solutions are for images that will be used with a wide international audience and not a specific cultural audience:

- Avoid depictions of people if possible. If the depiction of a person is not essential to understanding the message, then do not insert human figures into such images, because depictions of humans could only contribute to difficulty in creating effective images for international audiences.
- Use stylized stick figures if one must inset a depiction of a person into an image (see Fig. 6.1 for a sample stylized figure based on Horton, 1993). Such stylized stick figures lack visible hair or obvious clothing—both of which could indicate

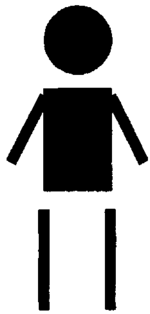

FIG. 6.1. A sample of a stylized stick figure for use with international audiences.

gender or social status. As these figures also lack hands and fingers, they also reduce problems related to gestures.

• In cases where depictions of true-to-life humans are essential, attempt to dress them conservatively with long-sleeve, collared shirts and with long pants (or long skirts or dresses) and shoes—not sneakers or sandals. Do not display any jewelry (including watches) or other accessories as such items can often reflect social class.

• Avoid depictions of women, if possible, because cultural expectations concerning women and gender roles can lead to varied and volatile responses. If an image must depict a woman, then it is advisable to display a figure with longer hair (acceptable in many cultures) and to dress the figure conservatively—in a dress that goes below the knee and in a collared, long-sleeve top.

• Avoid using hands and fingers when creating an image for an international audience. If, however, an image must depict hands or fingers, then show the hand holding some object (e.g., a pencil) or performing a specific action (e.g., pushing a button), because hands and fingers that are performing a specific task are often not perceived as making a gesture but rather as completing a specific task (Horton, 1994).

If designing online images for a specific cultural audience, then research that culture to learn the gender roles, offensive gestures, and expected dress associated with professionalism in that culture. Next, use these research findings to design images that meet the specific expectations of the culture in question. If possible, have a test audience from that culture review the image prior to using it with a larger target audience. Ask the audience if the image would be considered acceptable by other members of their culture; also ask what could be improved or enhanced to make that image better meet the expectations of users from that culture. If the test audience objects to the image, then find out why and ask what changes would make the image more "culture-friendly." This information can be used to create a new culture-specific image that should again be user tested with a sample audience from that culture.

Teaching Tips. To help students better understand how depictions of people can lead to cross-cultural communication problems, instructors can use the following two-part exercise:

- Part I: Have students review websites designed by members of two different cultural groups: one from Western Europe, the other from a nation in the Middle East or Northern Africa. Students should attempt to review three different websites for each of these two cultural groups. If possible, the students should use sites that offer images of individuals performing the same task in a similar setting. After reviewing 5 to 10 of the images found on each site, students should list the differences they noticed between the two sets of images.
- Part II: Have students use the list from Part I as a guide for designing a single online image of a person: an image that both cultural audiences would find acceptable. Then have students give a presentation in which they explain and justify their design of this final image.

Accessing Online Information

Individuals from different cultures often access and use the Internet differently, and these different usage patterns can affect intercultural image design for online media. Gillette (1999), for example, noted that, in some cultures, individuals often share an Internet connection and thus have a limited amount of time that they can spend reviewing web pages. One of the more time-consuming aspects of web page use, however, can be the time it takes for a page to "load." Although text tends to load relatively quickly, images files—especially large ones—often take more time to load. Thus, web pages that contain large image files, multiple image files, or multiple large image files, can all take considerable time to load—time that individuals in other cultural contexts might not have. Moreover, in much of the developing world, telecommunications technologies might be more limited than many Westerners realize. For example, many Internet users in Ukraine only have access to 33.6K modems (Kudlay, personal communication, July 10, 2000). As a result of such technology limitations, loading web pages with images can be quite time consuming in developing nations. This loading time could moreover be an expensive process depending on the cost of Internet service in a given country.[8] In other cases, the monitor resolution used by individuals in a given culture could be lower

[8]In some areas, connecting to the Internet costs as much as a long-distance telephone call, which can be quite expensive.

than the resolution used by the page's creators. An image that appears "beautiful" on a high resolution monitor could therefore be aesthetically displeasing, confusing, or indiscernible when viewed on a lower resolution monitor.

These technological factors related to online access could also affect whether individuals from a particular culture view a web page as credible. As the old adage goes, that which is difficult to use does not get used. Thus, online design aspects that result in lengthy downloads or indiscernible images could cause certain cultural audiences to disregard such pages as not credible, or as not credible enough to deal with the inconveniences related to using them.

Equally important is the printability of a web page, for, in some cultures, being able to print out a particular web page could be as important as accessing the page itself. As Gillette (1999) explained it, "If a culture values face-to-face discussions, people may print what they find on the Web to show coworkers or superiors without computers getting in the way" (p. 16). For this reason, technical communicators should consider using page layout that makes it easy and relatively inexpensive to print out web pages and to understand them once they are printed. Designing such pages, however, could mean changing the placement of visuals and text on a page, and could also mean designing graphics that look good on screen and are also recognizable when printed in black and white ink. Similarly, online design aspects such as the use of frames should be avoided with international websites both because they can take longer to load and because they can be difficult to print out in a format similar to their appearance on the computer screen.

Strategies and Solutions. Creating effective online images for international users often involves adjusting to meet an audience's patterns of online use as much as it is a matter of catering to that audience's technology limitations. For these reasons, technical communicators should do the following:

- Test pages by loading them at different modem speeds and with different screen resolutions to determine how accessible and how understandable that page will be to a larger international audience. When designing web pages for a specific cultural audience, technical communicators should do research on the most common modem speeds and monitor resolutions used by the majority of that cultural audience as well as on how Internet access charges are generally determined in that region (i.e., is access treated as a long-distance or a domestic phone call, and what are the relative costs of such calls).
- Establish an international minimum standard for modem speeds and monitor resolutions if designing a page for a more general international audience. Next, design all general-purpose international sites according to those standards. Developing such an international standard could be quite time intensive,

and could require periodic reevaluation as technology continues to change. Such a standard, however, could markedly increase the effectiveness with which individuals from other cultures can access and can use online materials.

- Keep the number of images on a web page to a minimum—only what is essential to understand the information being presented. Also, keep the file size of images to a minimum and avoid extra features (e.g., Java scripts, streaming video, etc.) that can take a great deal of time to load.
- Make sure that online graphics can be printed and understood without problem. Make sure these graphics can be understood in black and white, as well as in full color, so individuals with both kinds of printers can use such printouts. Such print-friendly graphics could be essential to understanding in cultures where printing out web pages is a regular practice.
- Provide a text-based (nongraphic intensive) version for all pages on a given site. Such versions allow users with slower modem speeds to access information quickly and allow for the easy printing of pages. Website designers should place a link to these text-based materials on a site's splash (main) page. Such a link could be entitled "Print Friendly Version" or "Text-Based Version for Users with 33.6K Modem Speeds." Additionally, these text-based pages should be in HTML format (which is universal and takes relatively little time to download) rather than using .pdf files (which require one have the correct version of Adobe Acrobat Reader to open files and can take a relatively long time to download).
- Take steps to ensure that a printout of a website matches the online version of that same site. Such parallelism makes it easy for individuals to locate information when moving from medium to medium, such as when two individuals are discussing what appears on a given website and one individual has a printout of that site while the other is looking at an online version of that site.

Teaching Tips. Teaching students about international technological disparity can take two forms—one based on observation, the other based on practice:

- *Observation*: Have students locate two or three professional or organizational web pages that they think are particularly good. Next, have students access these same sites at different modem speeds (ideally, at 124K, 56K, and 33.6K) and at different monitor resolutions (ideally, at 1024 × 768 pixels, 800 × 600 pixels, and 640 × 480 pixels). Have students keep a list of comments, concerns, and problems they encounter for each of these different settings. Next, have students try to print out various materials from these sites at different monitor settings. Finally, have students write up a list of disparities they noted between the printed document and the online document.
- *Practice*: Have students select a particular high-tech company they wish to represent. Next, have students design a web page/a splash page that they feel will

best represent the "cutting edge" nature of their company. Once the page is completed, have students load and review it at the different modem speeds and different monitor settings (see previous exercise) and keep track of the problems they notice. Finally, have students re-design the page to load at and to be discernable at a minimum modem settings (33.6K) and monitor resolutions (640 × 480 dpi). Once this revised page is completed, have students discuss the potential limitations such "minimal" design could impose on their ability to attract high-tech customers from industrialized nations.

RESOURCES TO FACILITATE INTERNATIONAL ONLINE INTERACTIONS

There is no magic spell that can instantly help one work successfully with individuals from other cultures. Rather, successful cross-cultural interaction takes time, patience, and a desire to learn more about others. Although learning about another culture is a long-term process, some introductory sources can provide a good overview of other cultures and other countries. The following cultural references are all online and free to access. For professional technical communicators, these resources can serve to supplement a departmental library. For technical communication instructors, these sites can provide much of the international online materials that students are asked to analyze as a part of the exercises presented in this chapter. They can also serve as a portal through which instructors can find additional international and culture-specific materials to use in class lectures, in the exercises mentioned in this chapter, or as the foundation for new exercises that help students explore international online interactions.

- **Permanent Missions to the United Nations**
  <http://www.un.int/missions/webs.html>
  This is a listing of websites of nations with Permanent Mission to the United Nations—New York.
- **Foreign Embassies of Washington, DC**
  <http://www.embassy.org/embassies/index.html>
  This is a listing of websites of Foreign/Non-U.S. Embassies located in Washington, DC.
- **The U.S. Commercial Services—Country Commercial Guides**
  <http://www.export.gov>
  This is a listing of country-specific commercial guides that contain information on certain nations; look under "Market Research" link in listing for each country.
- **International Monetary Fund—Country Information**
  <http://www.imf.org/external/country/index.htm>

This site contains listings of information on certain countries; some of the country information pages contain links to that country's banking and financial institutions and government organizations.

- **The U.S. Department of State Electronic Research Collection**
  <http://dosfan.lib.uic.edu/>
  This site allows users to search various U.S. Department of State databases for information relating to particular countries. Individuals using this database should check the publication/release dates of documents to make sure that they contain current information. Users should also keep in mind that many of the documents in this collection tend to be relatively lengthy.
- **Getting Through Customs**
  <http://www.getcustoms.com/>
  This website contains different kinds of introductory information on cross-cultural communication. These articles provide a good summary and can serve as a starting point for individuals unfamiliar with the concepts and terms related to this area of research.
- **Business Etiquette Around the World**
  <http://www.cyborlink.com/besite/>
  This site provides overviews of the business behaviors of specific cultural groups and compares each cultural group's business and communication expectations to the same set of qualities—or dimensions—developed by Geert Hofstede. Each of the cultural descriptions found at this site also provides "Resource" links to additional information on that particular culture.

All of these sources provide excellent introductory information on specific countries and can provide technical communicators with the kind of culture-specific data needed to build a good foundation for intercultural communication practices.

A PERSPECTIVE ON TECHNICAL COMMUNICATION EDUCATION

Today's students will need some understanding of culture and communication if they wish to become successful professional communicators. The development of such understanding involves raising students' awareness of intercultural communication issues and helping them learn communication strategies that can lead to success in intercultural exchanges. It then becomes the job of educators to determine how to best achieve these objectives.

Ideally, such objectives could be accomplished through a course on culture and communication in the new online workplace. The goal of such a class could be to examine many of the cross-cultural communication topics presented in this chapter, as well as provide greater depth and more examples related to these topics. Additionally, the exercises mentioned herein could be modified to create different in-class activities and homework assignments that students could use to explore culture, communication, and cyberspace. This combination of in-depth information and modified exercises would provide students with problem-solving activities that let them learn how to apply their knowledge. The result would be a well-informed student who understood both the theoretical and the practical aspects of international online interactions. Such a student, in turn, would be well prepared for the emerging international online workplace.

The creation of new classes, however, is no easy task. First, departments must have a faculty member who is both knowledgeable of these issues and who has the available time needed to develop and to teach such a specialized class. Even if there is such an individual, new courses often have to run a gauntlet of institutional committees in order to gain the official approval needed for them to be offered. This course development process is further complicated by the current financial situation facing many educational institutions. In many cases, the severity of this situation makes the prospects of hiring new faculty members/specialists or proposing new courses a difficult one. Technical communication departments, therefore, will often need to find alternative methods of training on culture and communication in the online environment.

One easy and inexpensive way for addressing this situation would be to rework the courses currently offered by a given department. In this case, instead of offering a specific course on culture and online communication, educators could examine their current course offerings in order to determine how the topics mentioned in this article might be incorporated into these classes.

The idea is not to have all of the aforementioned topics covered in a single class, but rather to determine how different parts and pieces of this chapter could be added to existing classes. An existing class on usability, for example, could easily include the concepts and exercises on "Accessing Online Information." Much of the basic information needed to cover these topics within the context of a usability class is presented in this chapter, as are the kinds of exercises needed to help students understand these ideas. Should the instructor need any additional information, the list of links in the "Resources to Facilitate International Online Interactions" section could provide initial resources for research or learning. Similarly, an existing editing class could include the materials presented in the "English as the Language of the Exchange" section, a class in visual rhetoric or graphic design could likewise include some or all of the information and exercises presented in the "Ethos and Image–Based Online Communication" section of this chapter, and so on.

The inclusion of these international activities into existing courses would mean that the individuals teaching those courses would not need to become specialists on culture and online communication. Rather, the information and exercises presented here provide the foundational materials needed to include these topics into a day's or a week's worth of class lecture and discussion. Moreover, presenting such information in the context of specific technical communication classes can help students better understand how the information they are learning on culture and communication relates to the daily tasks of technical communicators. Furthermore, by raising issues of culture and communication in multiple technical communication classes, the students get a degree of reinforcement that could not be achieved in a single course on culture and communication. This reinforcement over time could provide students with a better appreciation of how important an understanding of culture and online communication will be to their future careers.

In an ideal situation, technical communication departments would both offer a specific course or courses in culture and communication, and integrate aspects of culture and communication into the various other courses offered by that department. In light of the current financial challenges faced by higher education, however, the integration of cultural topics into existing classes would perhaps be the most pragmatic solution.

CONCLUSIONS

As international markets become increasingly interconnected, technical communicators need to learn how to design materials for audiences from different cultural backgrounds. And as online media are one of the key factors driving this new global economy, they will certainly play a central role in the international communication strategies of the future. This chapter has overviewed prospective problem areas related to online communication with individuals in other cultures and has also presented strategies and teaching tips that can help both practicing technical communicators and technical communication instructors gain a better understanding of some of the cross-cultural challenges that face them in the century to come. By understanding these concepts and employing these strategies, technical communicators can increase the effectiveness of the materials they design for global audiences, and instructors can better prepare students for the new international marketplace.

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7

Linking Russia and the United States in Web Forums: The Global Classroom Project

TyAnna Herrington
Georgia Institute of Technology

As the world shrinks under the influence of technology that enables quick, inexpensive, and reliable cross-global communication, web-based courses grow in value. Technical communication instructors can enrich technical communication curricula, encourage focused research, and help students learn to negotiate the demands of new forms of communication by providing forums for garnering experience in digital, cross-global communication. Professor Yuri Tretyakov, my collaborative partner, and I developed the Global Classroom Project to respond to the challenges of new forms of global communication, and used the World Wide Web (Web) as a conduit for class instruction and interaction. The project links students from Russia and the United States (and at the time of this writing, as an ancillary, Sweden) to collaborate in developing analytical digital products that treat issues in cross-cultural, digital communication. The Global Classroom Project allows students to study global communication issues as content, while simultaneously experiencing them. We hope that the project provides value to the field by accomplishing all three of the aforementioned goals.

This chapter describes a pedagogical theory put forth by Kemp that combines Berlin's (1987) and Kinneavy's (1971) theoretical models, then further explains our extension of that theory to address complexities that arise from a global course. Whereas this model provides a helpful framework for discussing pedagogy in any technical communication course, it is particularly helpful for decontextualizing elements of pedagogy in complex forums in cross-cultural distance learning. In this chapter, I explain the theoretical course basis, then apply the structure directly to explain our course development implementation, and assessment of the Global Classroom Project. Yuri Tretyakov, director of the language departments at the Russian Academy of Sciences and at the European University at St. Petersburg, and I have developed and taught courses and directed theses, independent study projects, and specially integrated studio projects within the overall umbrellas since we piloted the Global Classroom Project in spring 2000. We use the Web's capabilities for synthesis to support teaching technical communication in a way that combines information delivery, student access, and collaborative document generation, based on the tenet that students must develop technical communication skills in functional, contextual, and synthetic reasoning and communication (Herrington & Tretyakov, forthcoming).

In our roles as communication instructors, we are dually bound, not only to understand the synthetic nature of contextually functional communication, but also to desynthesize pedagogical context in order to analyze its elements, make choices in course delivery, and to package courses by way of effective pedagogical choices. Kemp (1992) provided a basis both for synthesizing and desynthesizing treatment of computer-based pedagogy when he meshed Berlin's and Kinneavy's approaches to written communication. Kemp suggested an overlay of Berlin's explanations of differing epistemologies onto Kinneavy's communication triangle, to illustrate the necessity that instructors match their epistemology with their chosen pedagogy, especially when making technological choices that must also follow suit. This chapter describes the Global Classroom Project, in particular, how and why specific choices were made for developing the Global Classroom Project, based on an extension of Kemp's structure; explains the kinds of problems encountered in a distance project of this type; and situates potential solutions within the same structure, or explains how the problems extend beyond what the structure provides.

TECHNICAL COMMUNICATION CURRICULAR/ PEDAGOGICAL ISSUES

Pedagogy in technical communication has been developing and evolving since the late 19th century (Cook, 2002, p. 5). Today, researchers and instructors in technical communication carefully consider pedagogical issues as they develop their courses, curricula, and day-to-day class projects and exercises, as is reflected in the literature in our field. A 1993 issue of *Technical Communication Quarterly*, entitled *A Special Issue on Teaching*, reflected on pedagogical development and the new challenges that technical communication instructors faced at that time. Recent work in technical communication questions our approaches to technical communication pedagogy and asks that we consider the disconnects between teaching that approximates "real-life" technical communication goals and students' classroom expectations (Spinuzzi, 1996). Work such as Cook (2002) and Selber and Johnson-Eilola (2001) provided clear foundations for desynthesizing the complex pedagogical issues and problems that arise in technical communication. Faber (2001) took a new slant on examining pedagogy when he treated issues regarding workplace training for "Gen-X" technical communicators. In 1995, Tebeaux asked that we examine technical communication differently now that we have added the element of distance made possible by new technology. New collections of articles focus specifically on the Web as a tool to support technical communication pedagogy, and these describe their forays into its use (*TCQ Special Issue on Technical Communication, Distance Learning, and the World Wide Web*, and *JBTC How Can We Address International Issues in Business and Technical Communication?*) and provide pointed treatment of specific pedagogical issues in technical communication (Selber, 1997). In addition, Starke-Meyerring and Clemens (1999) provided an excellent annotated bibliography pointing specifically to technical communication and Internet-based teaching.

A common theme binds these multiple sources in their treatment of pedagogical issues in technical communication. As Thralls and Blyler (1993) pointed out, the social approach is the primary basis for current technical communication pedagogy. This primacy is apparent even as it is instantiated in courses' different foci and in the many approaches and methods for teaching technical communication, as is apparent from the previous list of sources. Our Global Classroom Project, applying cross-cultural communication in practice, by its very nature is socially based and draws primarily from pedagogy enabling fluid social interaction and social negotiation to find meaning in cultural constructs. Just as it encompasses pedagogy, technical communication scholarship embraces research and writing on international and cross-cultural issues (Andrews & Theodos, 1997; Boiarsky, 1995; Bosley, 1993, 2000; Buddy & Grove, 2001; Dragga, 1999a, 1999b; Hoft, 1995; among others). Bosley's (2000) *Global Contexts: Case Studies in International Technical Communication* and Andrews' *International Dimensions of Technical Communication* provided rich resources in essays and case studies, and other work such as St. Amant (2002) brought together perspectives on computer use and socially based cross-cultural communication. Constantinides, St. Amant, and Kampf (2001) also provided a well-developed, helpful annotated bibliography of sources on intercultural communication. These sources provide a wellspring of rich ideas, advice, experience, and bases for course development and reflection; I hope to add to that list with this chapter, by providing a description of our experiences in developing a pedagogy for our cross-cultural, digital course.

Our field's expectations for technical communication courses is that students gain knowledge, experience, and/or ability in the following areas:

- core principles and concepts of technical communication (including document genres)
- communication competency (both textual and visual)
- working understanding of technology
- rhetorical principles for organization

- audience analysis
- critical, analytical ability
- visual and textual rhetoric
- ethical and legal principles
- cross-cultural, digital communication, shaped by knowledge in application

This chapter describes the different pedagogical forms that we used in developing and continue to use in providing learning experiences in the Global Classroom Project, based on our extension of Kemp's structure, provided in 1990, at the inception of the project.

KEMP'S STRUCTURE FOR PEDAGOGICAL CHOICES

In the early 1990s, when computer-based pedagogy was in the beginning stages of acceptance in a scattered few universities with forward thinking administrators, Kemp (1992) was diligent to prepare new instructors in computer classrooms, emphasizing the thought that each needed to devote time to before teaching. Kemp provided a framing structure from which instructors could make theoretically, pedagogically, and technologically informed choices about how to teach. Kemp drew his departure point from Berlin's explanations of the different epistemologies that drive our individually chosen beliefs about the structure of thought and location of "Truth." Berlin's (1987) framework, in which he described three epistemological belief systems (subjective, objective, and transactional), is well known to most composition and technical communication instructors.

In Berlin's structure, instructors who believe that "Truth" is located through their own series of beliefs engage in a subjective epistemology. Subjective belief systems support the subjectivists' belief that their perception or feeling about what is "Truth" provides the means to find "Truth," and that they must only search within to find it. In contrast, instructors who subscribe to an objectivist epistemology find "Truth" outside themselves. Objectivists believe that "Truth" exists independently from the believer and that the existence of the "Truth" does not depend on belief in it. In further contrast, the transactional epistemology assumes there is no ultimate "Truth," but that truth is determined through a socially communicated and negotiated adherence to a shared belief that functions to allow for common understanding. The truth subscribed to by one community is not necessarily the same as that which is subscribed to by another.

As Kemp pointed out, three pedagogies correspond to the epistemologies that Berlin described. The expressivist pedagogy, forwarded by compositionists such as Elbow (1991), supports students' efforts to write from within themselves, to focus on their own beliefs and feelings about issues, allowing them to write, often more to introspect rather than to communicate with others. Expressivist pedagogy corresponds to the subjective epistemology. Kemp asserted that instructors who believe that "Truth" resides within the individual would be served with a pedagogy that supports this belief by encouraging students to look for that "Truth" within themselves through introspective writing. He noted, on the other hand, that pedagogues who believe that "Truth" is objective in nature and exists outside and independent of an individual or group would find rather that formalist, current traditional pedagogy would forward that belief. Current traditional/formalist pedagogy supports the instructor's role as the conduit of "Truth." Early compositionists such as Genung (1986) supported the use of formalist/current traditional pedagogy to provide masses of students with information that *could* not—or corresponding to the objectivist's epistemology, *should* not—be questioned by students. The current traditional instructor with an objective epistemology would expect unquestioning students to be "filled" with the "Truth" that the instructor/expert imparts. Not only is independent student thought not expected in a current traditional/formalist classroom, it is discouraged.

Kemp contrasted a third group, those who follow a transactional belief that truth is negotiated communally and communicated socially, and suggested that this group would encourage independent student thought, finding compatibility in a social constructionist pedagogy. Instructors using this pedagogy encourage students to think for themselves and to develop their concepts of truth through argumentation and negotiated communication. Social constructionist pedagogy focuses on helping students understand the context and community of the communication studied. It teaches that the beliefs come from the contextual community, and that students must participate in the process of writing as a means to communicate with others in order to determine "truth," rather than searching for a preexistent "Truth" or following an introspective path to self-understanding of individual "Truth."

Kemp criticized instructors who subscribe to one form of epistemology and pedagogy without awareness or consideration as to whether their pedagogical methods match their subscribed epistemologies. He demonstrated how a mismatch of epistemology and pedagogy causes a disconnection in the classroom. Kemp noted that the Kinneavy Triangle, long referenced by composition scholars, can also provide a starting point to determine how to match epistemology and pedagogy by examining methods for creating communication. Kinneavy's triangle illustrates, through a visual expression, the intersections among writer, reader, subject of communication, with language as conduit between and among them all. Where the reader and subject form one of the triangles' sides, the subjective epistemology is represented; the side connecting the writer and subject represents objectivism; and the side connecting the writer and reader (and inner triangle among writer/reader/and language) provides a visual accounting of the transactional epistemology. Again, according to Kemp, each of these epistemological understandings of classroom communication must be supported by a pedagogy that furthers the communication goal rather than defeating it.

For Kemp, the synthesis of this structure for matching epistemology and pedagogy by way of Berlin and Kinneavy's work supports an argument that social constructionist pedagogy and transactional epistemology should form the basis of computer-based composition courses. Kemp noted that in order to teach composition classes in which students would make their writing their own, the instructor could be virtually rendered absent by networked computers, and students could use textual communication to more obviously (and with encouragement) negotiate their own community of truths in a socially constructed manner. Such networked environments help make the goal of student writing to communicate rather than to complete assignments. Networked computer composition classrooms provided one of the first successful examples of experiential learning to support communication skill development, context and audience awareness, and motivation to use writing as a communication tool.

But complications with this framework arise when experiential classrooms and courses of study such as technical communication require multiple forms of instruction within the same classroom structure, sometimes to deliver information, at times to bring students to introspect, and at others, to support the overriding goal of teaching the context, audience, and function of negotiated communication. Courses, like individuals, are rarely so delineated that they follow one category of truth-seeking at all times, and technical communication classes are a good example of those that require each of these instructional forms at different times. The Global Classroom Project, providing web-based networked classrooms that link students from Russia and the United States, is illustrative of an experiential learning forum that requires all these epistemological and pedagogical forms. The difficulty is in determining the appropriate instances for using a given epistemology, pedagogy, and technology. An expanded version of Kemp's structure has provided a fruitful basis for course and project development, and since the beginning of the project in spring 2000, provides a basis for course explanation and assessment as well.

SPECIAL NATURE OF WEB USE FOR TECHNICAL COMMUNICATION

The World Wide Web and the Internet are ideal tools for teaching technical communication, a field that depends on communicative interaction for document development. They also provide an ideal environment for students to experience the contextualized processes in which communication must be created. The Web offers an outstanding basis for conveying through all the noted pedagogies, but in particular for the social constructionist, and in its own way, the current traditional. The Web is well touted for supporting dialogic interaction among communication participants when it is used for operating conferencing software, webmail programs, MOOs, IRC (Internet relay chat), or other dialogic programs. Any number of participants can freely interact in conversation, particularly if their interaction is well supported by instructors who deemphasize their own presence in the conversation space. In addition, the very nature of the Web can defeat time restrictions by acting as a depository for conversation, visuals, or other material that can be activated to support interaction each time a new participant accesses a jointly used site. Where a traditional face-to-face classroom depends on all participants meeting at the same time to work together, the Web allows students to work together over relatively unlimited time spans, thereby changing the concept of time for purposes of class structure.

The Web also supports current traditional pedagogy by allowing space as a blackboard, of sorts, for posting information that the instructor expects to be treated as "fact" or "truth" for class purposes, and by acting as an archive for all course materials. The greatest advantage for our purposes is that the Web is accessible worldwide at any hour of the day for classes, course material access, and collaborative project group interaction. In addition, it can be designed to defeat the sense of place that can dominate a physical location and, in turn, provide cultural markers of only one culture.

Each of these benefits is applicable to courses in technical communication, whether or not they are global in nature, making the Web an inviting place for technical communication courses of all kinds. In fact, both Texas Tech University and the University of Minnesota provide complete degree programs in technical communication through the Web. Instructors in universities around the country have used the Web for special projects, both in distributed learning on their own campuses and to link to other universities as well, such as Michael Day's project linking South Dakota School of Mines and Technology, City University of New York, and Southwestern Louisiana (1994); Enteen and Gajjala's (2002) project in which they connected the honors college at the University of Central Florida and the communications department at Bowling Green State University in 1999; and Davis and Rouse's (2002) 2-year course linking classes at the Blekinge Institute of Technology in Karlskrona, Sweden, and Ohio University in Athens, Ohio. As global business proliferates and technical communicators are entering workplaces that are no longer situated only in the physical locus of their home countries, technical communication courses will have to become more "globalized" as well, merely to help prepare technical communication students for what they will likely face after graduation. Even if the benefits of the Web for global courses may not seem as useful today, they may be necessary in the future.

Possibly even more important is the way the Web can be used to support the long tradition in technical communication of treating visual rhetoric, both in courses and research. The Web is an extremely useful vehicle for displaying visual material for critical assessment, and for developing digital documents that display design features to promote optimum user accessibility and usability. Both of these elements are important foci of the work that many technical communicators produce in the workplace today, and will be even more important in the future as digitization overwhelms print for information transfer.

APPLIED STRUCTURE AND NEW CATEGORY ADDITIONS

Web-based distance courses that link more than one university in collaborative teaching efforts require instructors to consider complex epistemological and pedagogical bases, in part because effective teaching demands that instructors share course development and responsibilities in a form of "distance mutual instruction" (Herrington & Tretyakov, forthcoming). To further complicate strategy development, globally diverse webbed classes also require that epistemologies and pedagogies correspond to different countries' political foundations. The Global Classroom Project needed initial assessment of differences in Russian and American course goals; instructor training and teaching styles; university administrative backgrounds; cultural experiences; linguistic, temporal, and technological limitations; and political foundations. Based on this needs assessment, we made choices in epistemology and pedagogy that we felt would best deliver information, where needed, and that would support introspective understanding of cultural similarities and differences in addition to encouraging critical research and creative collaboration in technical communication. The following section of this chapter describes the Global Classroom Project in more detail, noting elements of significance for illustrating the framework already described. It also provides analyses of many of the course elements, pointing to examples within the course structure that illustrate the necessity of mixing epistemological and pedagogical choices in an experiential course setting.

GLOBAL CLASSROOM PROJECT DESCRIPTION

The Global Classroom Project is a forum for cross-cultural, digital communication, and collaborative project development, linking students and colleagues in St. Petersburg, Russia, at the European University at St. Petersburg and at the Georgia Institute of Technology in Atlanta, Georgia. The project expanded in fall 2002, at this writing, to include students and colleagues from the Blekinge Institute of Technology in Karlskrona, Sweden. Global Classroom Project classes provide forums for experiential learning that demand a high level of person-to-person communication and interaction, centering on the challenges of real-life contextual communication (Herrington & Tretyakov, forthcoming).

Most communication in the Global Classroom Project is conducted online and focuses on analysis of cross-cultural, digital communication. Both in subject area study and experientially, graduate and undergraduate students explore issues in this area, analyze them, and report the results of their research, experience, and analysis. Students' overall textual/visual goal in the courses is to provide effective, clear, well-designed text and digital products that reflect the results of their research and experiences. Class assignments are generally resumes (student-to-student introductions), plans of action (proposals), and reports of analytical work (analysis and digital project report). Classes are primarily virtual in nature, conducted both on the World Wide Web through WebBoard conferencing software and through e-mail. Graduate students and professors in humanities courses (including sociology, history, economics, ethnography, and art history) and in technical courses (including information design and technology, human computer interface, educational technology, and graphic design) also conduct independent and collaborative group research and assessment projects, using materials from the Global Classroom Project. Often, courses become subjects of study for thesis and final digital projects needed to complete graduate study.

The idea for the Global Classroom Project stems from my experience with Kemp's "Interclass" project that linked students at Texas Tech University, the University of Texas, and San Francisco State University in shared classes over the Internet in spring 1990. I thought the logical next step would be to extend the Interclass concept across global boundaries, and because I was interested in Russian study and had been interested in Russia for some time, the idea of connecting what I thought were radically different cultures and political systems seemed like a worthy challenge. Ironically, or maybe kairotically, at the same time during 1990, Yuri Tretyakov, director of the language department at the Russian Academy of Sciences in St. Petersburg, and Kenneth Knoespel, then chair of the school of literature, communication, and culture at the Georgia Institute of Technology (Georgia Tech), were developing an exchange program between the two universities. A series of exchange visits followed in 1993, linking scholars in communication, literature, and science from the United States with their counterparts in Russian post-Soviet scholarship. As continues to be the case, scholars and students alike were looking for ways of adapting to standards accepted in the international academic community. Also in 1993, I began to develop a series of proposals to pursue the Global Classroom Project, and while teaching technical communication in the computer classrooms at Texas Tech, learned and tested technology and developed an applied theoretical base for the project.

I joined the faculty at Georgia Tech in 1997, and also joined Knoespel in his deliberations on how to expand the exchange program that he and Tretyakov had built, to include a distance-learning initiative. The fruits of our discussions began to materialize when, with the support of Tretyakov (by then also director of the language department at the European University at St. Petersburg as well as the at Russian Academy of Sciences), I was awarded a Fulbright grant to pursue the

Global Classroom Project during the 1999 fall semester, and teach the first full-fledged course in technical communication for graduate students and faculty at the European University. Tretyakov and I began working together to develop what has truly been a mutually negotiated plan for course delivery and project development. This plan has led to successful completion of six semesters of the course at this writing. During the 1999 fall semester, while creating our project plans, we tested the technology for future course development and provided seven workshops in digital communication for Russian faculty. Tretyakov was granted a leave of absence to teach at Georgia Tech during the 2000 spring semester, and with Elena Kazei, our faculty colleague who was the point person for helping students in St. Petersburg, we taught the pilot version of the course that spring. The work during the pilot semester allowed us to identify major pedagogical, methodological, technological, and financial issues.

To our knowledge, the Global Classroom Project is the only distance-learning course that has been jointly developed from its inception, and that truly reflects the academic and cultural interests of the United States and Russia. It is completely interactive in nature, and does not depend on canned "course in a box" materials such as CD-ROMs or video lectures. Students in Russia and the United States truly collaborate in class discussion and analysis of issues in cross-cultural and digital communication, and produce creative digital artifacts that reflect synthetic knowledge acquired in their analyses.

APPLIED FRAMEWORK

The Global Classroom uses diverse information delivery structures, and requires students to develop and communicate information through multiple methods. Following Kemp's strategy, each of these forms of teaching should be consistent with the epistemology that drives the course goals. The following section illustrates some of the many combinations of epistemology and pedagogy that are required in a global experiential course of this kind, and addresses some of the problem issues that we have encountered in creating and supporting the course.

Objective Epistemology/Current Traditional Pedagogy

Where an objective epistemology is well matched with formalist/current traditional pedagogy, the potential technological choices for supporting this combination are not as clear cut, not determined by the common characterization of the technology itself, but rather, depend on how the technology will be used. Therefore, we have had to make technological choices based on more than just the intended use, but on actual use. For instance, the Web is touted as a breakthrough technology for interactive reading and text creation. Its inclusion of graphics, animated and otherwise, give it a level of communicative complexity that draws on senses as well as on literate training. As I noted earlier, using the Web as a delivery system for visual materials is particularly helpful in a technical communication course of this kind. But, if we merely provided visual materials in the form of information, accompanied by a qualified judgment about their correctness, we would follow current traditional methodology. Where, by its nature, the Web would seem to fall squarely into a technological category that would support a transactional epistemology and social constructionist pedagogy, it can also be used as a static information delivery system in the same way that lectures, books, and articles may be used, so we must consider its *use* rather than its characterization when examining the way we apply it in the Global Classroom. E-mail, interactive and dialogic by nature, may also be used as an information delivery system. Static files created on a word processor may also be used to deliver information. Although we use technology overwhelmingly to support social constructionist pedagogy, at times we must choose a current traditional method and use the Web to support this kind of teaching as well.

Both the cross-global nature of the Global Classroom Project, as well as its characterization as a technical communication course, require that we use current traditional pedagogy in some instances. St. Petersburg and Atlanta are not only separated by the Atlantic Ocean, but also by an 8-hour time difference and by a course schedule that slows correspondence between the Russians and Americans by as much as 4 days at one time. Our universities' mandated class scheduling, coupled with the Russian participants' limited access to computers, makes it impossible for us to conduct synchronous classes. In a synchronous setting, we could provide course content in a dialogic manner, by chunking material into short sections and asking for immediate student response, then providing new chunks, eliciting new responses, and so on. But in our asynchronous setting, we have had to rely on a more formalist form of pedagogy, and to provide content information in large, complete wholes, even when we want students ultimately to respond later, dialogically, to the material provided.

In addition, as in all technical communication courses, in the Global Classroom we must also provide content that could be characterized as purely informational, and at least for purposes of our course, could be considered "factual." Our explanations regarding how to make choices in typography and text treatment for optimum reader accessibility require that we convey consistent principles from which students can draw to make choices in document design. Typically, in technical communication, we must draw from tested principles to make informed, critical decisions about the effect of those choices on readers'/viewers' perceptions. Those principles can come from accepted understandings of physiological responses, or from accepted beliefs about common cultural constructs. We accept as knowledge that the darker the text, the more it attracts the viewer's gaze. And we also may accept the premise that the Chinese culture favors reading patterns from top to bottom rather than from left to right, as a means to understand the effects of our work in different cultural contexts. If we want our students to base their work on these and other accepted principles, then it is to our and the students' advantage that we provide them from an objective epistemology supported by a current traditional pedagogy. For example, we present the principle that text set all in uppercase letters is more difficult for readers to access than text set in upper and lower case, and that using bold text treatment emphasizes information, allowing it to stand out, or in the case of headings, to guide readers through an organizational document framework (Craig, 1980, p. 23). Because this information is treated as "fact" for purposes of our course, it is appropriately supported by a current traditional pedagogy that conveys it as such.

Another issue that has been important to our consideration of course development is finding the appropriate match between epistemology and political background in addition to the overall match with pedagogy. The Global Classroom Project creates a collaborative learning environment that has to accommodate our two countries' differing cultures and educational systems, but it has also called for planning to accommodate our differing political systems. Although the Communist system of the Soviet Union was replaced with Russia's developing democratic structure nearly a decade before we piloted the first class of the Global Classroom Project, its influence remains imprinted on Russia's educational system. The very nature of our project, overwhelmingly based in goals supported by transactional epistemology and social constructionist pedagogy, despite our intermittent reliance on other epistemologies and pedagogies, flies in the face of the former political structure.

Under Communism, the government imparted all "Truths" for its people, and penalties as severe as imprisonment and death were laid down for those who questioned those "Truths." "Truths" were often hard-line educational theories based on hard scientific data, supporting cultural assumptions that might be considered questionable today, which notwithstanding Kuhnian explanations for their constructed nature, were formulated as objective beliefs. The only pedagogical match with Soviet epistemology was current traditional/formal teaching, primarily carried out in lectures and books. And today, even though Russian democracy is strong and the educational structure is becoming more malleable, both faculty and students are consistently trained in a current traditional educational structure, and are only now experimenting with new educational formats. To our great advantage, the European University, newly born in 1995, was created with a view toward transforming educational method in Russia. We have been fortunate that Boris Firsov, the European University Rector, has supported this vision by encouraging us to introduce what are considered radical new pedagogical methods in Russia. Not only are we teaching joint classes of Russian and American students, but we are teaching them through computers, requiring collaborative projects, and supporting all course activities and information development through dialogic processes. Not one of these aspects of the Global Classroom Project would have been allowed under the Soviet educational system; thus, there is no model for their use today.

Although our Russian students have, to their credit, embraced the challenges that we have provided in the course, we are mindful that they, as well as the American students who may also have come from current traditional educational backgrounds, benefit by some "grounding" in familiar formalist information structures where appropriate. And as I noted earlier, there are times when providing information as "fact," at least for purposes of a course or program, can be advantageous. Despite the questionable nature of "truth" to be found in hard research in a field such as ours, there is an element of our field that relies on some principles that are treated as "fact." Porter and Sullivan (1997) examined the difficulties and shortcomings of research conducted in technical communication, taking note that the social nature of the subjects we study make it difficult to substantiate data as "fact." But we do have to treat some elements as fact in order to develop a basis for making judgments for effective communication. When we rely on these facts as a basis for teaching, current traditional pedagogy is effective.

We have found that as a course that is experiential in nature, the Global Classroom encompasses multiple realms of human experience, and cannot be either taught or represented by one epistemological framework or appropriate accompanying pedagogy. Although our course is far different from a class in creative writing or poetry, there are instances when even the subjective epistemology accompanied by an expressivist pedagogy has served our course needs.

Subjective Epistemology/Expressivist Pedagogy

The overall goal of the Global Classroom Project, that students and faculty successfully negotiate an understanding of how to effectively communicate cross-culturally and digitally, is clearly supported by epistemology and pedagogy that are dialogic and result in bargained "truths." But there are times, even with the overall project goals in mind, that students can make strides in this direction through introspective devices. At these times, we find that subjective epistemology, supported by expressivist pedagogy, serves the course needs well. When we ask that students develop a critical understanding of their own and others' cultures, they must begin with points of reference for cultural comparison. We have found that often the most effective means for students to examine others' cultures is by looking at their own. This kind of examination, initially best supported by expressivist pedagogy, often requires introspection that can be used before beginning a later dialogic process. This process continues as students compare their views of their own and others' cultures, and then progress to a form of dialogue that is next, best supported by social constructionist pedagogy.

Introspection can also be made a part of students' analytical work. For instance, during one semester, students compared cultural responses to visual imagery as a beginning point for analyzing differences in cultural perceptions of graphics, colors, and other aspects of visual communication. We asked the students to examine their feelings about images and to find examples of images from their own cultures that they thought best represented their countries' expressive visual representations. After they chose images, and without revealing their reasons, we asked them to show their respective images to one another and explain their own (and differing) responses to the images provided. Then students discussed their findings and revealed the reasons for their choices, developing a basis for examining visual communication from cross-cultural perspectives. Web technology provided terrific support for this kind of introspection, both in enabling students to search for images they could use to illustrate ideas for class, and to transfer the visual information to one another. The Web is a tremendous departure from the traditional face-to-face classroom and even from a text-based Internet class, in its ability to house visual information for perusal and response from anywhere in the world. Its expansiveness provides any number of cultural visual icons, made publicly accessible by companies and individuals in their home countries. The research potential is extreme. The capability for accessing thousands of e-business sites, for example, on which to base a cultural comparison worldwide, enables only one of the potentially thousands of ways the Web can be used to examine information, particularly in its visual forms. In addition to Web use for accessing visuals, students were able to use word processing technology as a tool for brainstorming and introspecting about their choices, a tool supportive of expressivist pedagogy, in this instance. In the latter part of the exercise, however, the Web's function as a conduit for interactive dialogue allowed an appropriate shift of technology use to support the move into transactional epistemology and social constructionist pedagogy, again, the overriding basis for the course.

Transactional Epistemology/Social Constructionist Pedagogy

The courses in the Global Classroom Project not only involve dialogic goals, but are designed to be experiential in nature. The element of experience ensures that classes reside squarely in an overarching transactional epistemology accompanied by social constructionist pedagogy. While students examine issues in cross-cultural, digital communication, they are also experiencing it; thus, they cannot help but participate within a dialogic framework. It is in the "real" aspects of the course that we feel students learn the most, but it is also this basis that complicates the course and makes it difficult to plan, manage, teach, and assess, and admittedly, makes it difficult for students to participate in.

The experiential nature of the course creates a disorder that is actually the course's greatest value, because it is the chaos of real human communication that is part of the experience. Spinuzzi (1996, p. 296) wrote about the difficult intellectual divide created when students take a course with the goal of a grade in mind and instructors teach a course to provide experience, particularly if the classroom experience is an attempt to mimic real-life conditions. But, even in a project such as this, where the experience itself is unique and thus cannot mimic a workplace occurrence, reconciliation between student and instructor expectations is made difficult on every level: administrative, temporal, linguistic, epistemological, technological. But this is the nature of communication. It is messy, unruly, not bound by a series of rules that can be counted on to absolutely predict communicative behavior. As such, an experiential course is truly based in transactional epistemology. It is also based on a dialogic process of experience that reifies the transactional theory that what is true is negotiated through communication. "Truth," in this case a definitive (if possible) determination of what is effective communication (textually and visually) and accepted by both Russian and American cultures, is negotiated anew each semester. Student interaction, definitions of effective and ineffective teaching, and the potential "absolute" characteristics of the course in their technological, administrative, and political frameworks, are constantly shifting, making each class different in each semester. Students' objectives are often to get the grade they want. In a traditional course such as one in which students are asked to memorize a list of document genre characteristics, they might have a roadmap to follow by looking for "right" answers. But in an experiential course where "truth" is continuously negotiated and renegotiated, the "right" answers shift from week to week and semester to semester. The dissonance for students is in the very basis of the course: its experiential nature. Therefore, notwithstanding the previous examples that explain our conscious choices to use other pedagogies based on other epistemologies, where advantageous, we base the bulk of the course in a transactional belief and current traditional pedagogy.

Negotiating communication in workplace settings can be just as extreme, and I did not intend that the description apply only to classroom interaction. But the context of workplace activity is different in several important ways. Technical communicators come to workplace positions, at least to some degree, by choice, although they may not choose their specific assignments at work. As I noted earlier, our students taking technical communication classes are engineering, computer science, architecture, literature, and management majors, and they often come to the class expecting only to meet a course requirement. In addition, they have only one semester to become accustomed to one another, the technology, the course requirements, and our expectations for participation and project development. They have no long history of company structure to rely on. The compressed nature of the experience adds an extra burden for them and for us, and adds to the chaotic nature of the learning environment. In an ideal situation, we would extend to the course at least over two semesters with the same group of students, which we expect would help ease some of the discomfort of learning nearly everything for the first time within a one-semester course.

SPECIFIC CHALLENGES AND RESPONSES TO EXPERIENTIAL/TRANSACTIONAL CHAOS

The greatest assets of a course of this kind also create its greatest difficulties, which we often cannot account for from day to day. But I provide here a list of some of our recurring challenges and our attempts at conquering them. Instructors who wish to pursue their own experiential courses of this nature may find it helpful to read an overview of these sometimes successful, sometimes failing attempts to smooth the chaos of developing and pursuing a course of this kind. At the least, I hope it will help instructors anticipate problems that they might face in their own courses. The following are some of the recurring challenges and our responses to them.

Temporal Issues

Like nearly any global course, ours comes with the difficulty of teaching joint classes across different time zones. The 8-hour time difference between Atlanta, Georgia, and St. Petersburg, Russia, requires that not only we, but also our students, must develop a unique sense of time perception in order to work successfully within the Global Classroom structure. Whereas the American students are just beginning their days, the Russian students are ending theirs, and whereas the European University classes are always taught on Tuesdays and Saturdays, Georgia Tech's classes are taught on the standard university schedule, either on Tuesdays and Thursdays or on Mondays, Wednesdays, and Fridays. This means that within the restrictions of our universities, classes cannot overlap for synchronous discussion and collaboration. The experiential nature of the course dictates a situation in which students in one semester's classes may make quicker or slower progress on a section of work than in another, so we have to be flexible in planning each day of instruction. In our roles as instructors, we must begin e-mail discussion about our class assignments at least 1 and often 2 days ahead of the first class' day online. So, for instance, if the American students have a Monday class at 10 in the morning Atlanta time (9 at night St. Petersburg time), the Russian students' corresponding class will be on Tuesday at 9 in the morning St. Petersburg time (1 in the morning Monday Atlanta time); we instructors must begin discussing the class assignment by e-mail, at the latest, on Sunday morning at 10 Atlanta time, which corresponds to 2 on Sunday afternoon St. Petersburg time. Six or seven e-mail posts and responses may go back and forth through the day as we decide our teaching plan for that class day. The students also must develop this kind of plan for e-mail correspondence in order to accomplish their collaborative work together.

Workplace technical communicators and multimedia designers experience these same kinds of difficulties in meeting their schedule demands when working across time zones. Curry (2000), a multimedia developer for IBM, told me about the problems he and his coworkers experienced in file sharing between Atlanta, Georgia, and Los Angeles, California. They had difficulty meeting deadlines, in part because the time differences created a lag between design groups' responses. He also noted the difficulty they experienced with communication resulting from employees' cultural differences, even though they were only regional in nature. The experience that students gain in finding solutions even to the nuts and bolts problems of temporal difference can be invaluable for preparing them for their future workplaces. As Curry's comments indicate, students who participate in cross-national courses can also gain from this experience.

The "in-class" assignments and correspondence are not as closely tied to specific time structures. In reference to the previous example, we would post the class assignment on WebBoard, a webbed network communication program, for Monday morning in the United States by Sunday night, so that the American students can begin working on it in class Monday morning. Then the Russian students are able to access the students' responses any time before, or at least by, the time they attend their own class on Tuesday morning in St. Petersburg. From that point, the students from both sides of the ocean are able to access and participate in class assignments any time they have access to computers, although the Russian students usually only have access during their own class times. But then the sequence begins again in preparing and participating in the next class assignment for the following class day.

Another aspect of temporal challenge arises from the differing semester schedules in our two countries. The American students begin their semester at least 2 and sometimes 3 weeks earlier than do the Russian students, and the Russian students' semester ends at least 2 and sometimes 3 weeks later than the American students. The American students take their Global Classroom courses as technical communication classes, so I usually use the first 2 to 3 weeks to introduce them to the principles and concepts of technical communication in order to prepare them for developing their assignments once the Russian students join them online. When the classes are whole, with students from both countries attending, we introduce subject-specific material and provide a basis for applying technical communication principles. The Russian students begin learning these same principles in their own classes at this time, and students develop resumes to send to each other in digital form so that they can learn more about each other and their academic interests. The material we provide is the same sort of "foundational" information that makes up the basis of any course in technical communication. Students study the principles and concepts of audience analysis, document design, textual and visual rhetoric, ethical and legal issues, culturally constructed power structures, and others. These issues, not foreign to other courses in technical communication, are well supported by web technology and are not dependent on the special nature of a cross-global course.

The students work together as a whole on class assignments for the first third of the course, then split into collaborative groups to begin their specific project work together. They write proposals, progress reports, and analytical reports, and develop digital projects. Students in the United States end their semester with oral presentations. The Russian students then use the extra 2 to 3 weeks to revise the analytical reports that the students wrote together, and to prepare their own oral presentations. In the normal semester period, Tretyakov attends the American students' first class of the semester face-to-face in the United States, and I attend the Russian students' last class of the semester face-to-face in Russia.

Linguistic Issues

English language drives the Global Classroom Project, for several reasons. The Russian students take the Global Classroom Project course as part of their English and communication requirement at the European University. Their firsthand experience with English language and communication in a real-life setting has provided a special asset within their educational experience. Nevertheless, we would prefer to be able to provide at least part of the course in the Russian language as well, to add to its cross-cultural basis. But, very few American students know the Russian language at all, and even fewer know it well enough to work with course materials in Russian. In addition, to transport Russian language digitally requires Cyrillic alphabet encoding, which few computers handle effectively or efficiently. Despite the introduction of Unicode, which was intended to provide an encoding system for all linguistic characters, Cyrillic characters are still generally sent in the forms of three differing encoding systems, none of which work well consistently. Even after several years of experimentation and the help of professional consultation in Russia, we have yet not found an effective system for transferring Cyrillic between PC and Macintosh computers. (This technological/linguistic dominance, of course, points to a broader issue regarding cultural dominance of English [and the United States, by extension] in the global workplace. Although this is an extremely important area for discussion, especially in light of the recent developments in international relations, this topic is not within the scope of this chapter.)

We continue to consider ways to provide greater linguistic flexibility to the course. In the 2002 spring semester, Larry Joseph, director of Russian at Georgia Tech, provided a special section of the course on Russian short-form adjective and its cultural considerations, which both Russian and American students found interesting and instructive. We hope at some point to be able to include a class of American students learning Russian, so that we can provide greater linguistic balance. The Russian students' grasp of English has been excellent, however, and although they make greater effort to participate in all aspects of the course, they have had great success in communicating well with the American students and in keeping up with course reading assignments in English.

Administrative and Cross-Disciplinary Challenges

Some of the difficulties in developing and teaching courses in the Global Classroom Project are as much administrative in nature as pedagogical, linguistic, temporal, technological, or otherwise. The students at the European University are graduate students taking courses toward completion of master's and doctorate degrees. Their coursework is in humanities fields, encompassing history, political science, sociology, art history, economics, and ethnology. The American students are graduate students pursuing master's degrees in human computer interface and information design technology, as well as undergraduates in the humanities degree, science, technology, and culture, and in engineering, architecture, and business. Undergraduates take the Global Classroom Project course as a special topics technical communication course, but may also participate in the course as students taking a required technical communication survey course. The variety of students' educational levels, experience, and academic interests adds to the complexity of student makeup that makes the course interesting and challenging.

Although the makeup of the Russian participants stays relatively consistent at from 12 to 15 students in the varying degree interests already noted, the ratio of American graduate to undergraduate students varies from semester to semester. In some semesters, there may be 10 graduate students to 3 undergraduates, and in most other semesters, there are from 2 to 6 graduate students to 25 undergraduates. At times, the graduate students have acted as group leaders for the digital portion of all the students' projects, consistent with their academic interests, but most often graduate and undergraduate students have blended together and worked on an equal basis throughout the course. Our undergraduate students are generally very advanced academically and have no trouble working with graduate students. And most undergraduate students have had work experience as interns with companies in their fields of interest, so they seem to be comfortable with the shared work. The greatest challenge comes from the differences in students' academic interests.

Beyond any difference in cultural backgrounds that derive from living in different countries, the difficulties that arise when students from differing academic cultures work together seem most prevalent and also most reflective of the communication difficulties between engineers and technical communicators, long noted by participants in our field. The American students note that they have few problems communicating with the Russian students, as compared to their communication with each other. Students from humanities fields complain that they do not understand the methods and purposes by which students from technical fields work, and vice versa. We offer the usual advice for working collaboratively, such as making sure to choose a group leader, allocating duties fairly, and making clear (and signed) contracts to divide the work and ensure that each group member knows what is expected. The advice in our field recommends setting group assignment dates far in advance of course deadlines. Beyond this, our solution for learning to work with others across disciplines has been simply to have students experience it. The course is so complex and time consuming as it is, that this is one area that we have not attended to carefully, and we have had to merely hope that the students would work through their problems, relying on our advice and our help when and where it may be needed.

Our greatest concentration within cross-cultural communication has been on ensuring that students from Russia and the United States understand each other and learn to work together. Because the Russian students' grasp of English is so good, there are relatively few linguistic barriers to mutual understanding, despite the occasional problems that can be easily remedied. For instance, in one semester, while attempting to analyze the different cultural influences of the visual rhetoric of architecture, one of the collaborative groups came to an impasse over the definition of "monument." The Americans included buildings in their definition of monument, and the Russians felt that the word concerned only statues. Other researchers and instructors in technical communication have reported problems of this kind in cross-cultural communication (Carroll, 1990; Extell, 1993; Hall, 1981; Hofstede, 1997; among others), and for these communication glitches, we can introduce the kind of work that has been done in the field to treat communication problems of this sort.

But there have been instances where the difference in cultures has made group work more difficult, and this is necessary, and welcomed, as part of the course focus. For example, the American students, partially because many are attending school in the South and are from or either influenced by the American culture of the South, use extremely polite, almost tentative language to voice opinions about group work and to negotiate subjects of study or the direction of the work. The Russian students are much more direct in their comments about their joint work. On more than one occasion, an American student has said, "Yes, I think that's a good idea, but . . ." meaning to reject an idea, where a Russian student understood the comment as agreement to go with the proposed idea. The most consistent problem in group communication is that students seem to have difficulty coming to agreement on topics to pursue. (We give them a broad subject area for study and ask them to choose a focus within it.) Instructors in face-to-face teaching environments also experience problems in group communication, and may find, like we do, that these problems create opportunities for examining methods for responding to and enhancing communication efficiency.

Both Russian and American students seem to compromise well, but groups are often not happy with the direction their research takes. In some instances, the responses may be a result of differences in access to and interest in technology. For instance, in the 2002 spring semester, one of the groups was studying an aspect of Internet technology as an information delivery system. The Americans wanted to study by way of IRC and chat rooms, but the Russians had neither the access to nor interest in this kind of synchronous communication. The group chose to study religion on the Internet instead, and the Americans examined religious chat rooms, in part because the Russians were interested in studying contemporary religious development. The Russians provided more of the analytical content concerning religious interests itself, and the Americans studied instances of chat room use to discuss religious content. This means of dealing with different aspects of a topic within the same topic framework provided a method for tying the topic foci together, but did not necessarily bring the students together as a group. The compromise seemed to be good, but the students were not satisfied overall. The complexity and challenges of the Global Classroom Project are illustrated in this example. The dissatisfaction in this instance may have more to do with the differences in academic foci than those in national culture.

Overall, however, students seem to compromise and work together well, which may actually create a problem of its own. Because students find the Global Classroom to be a unique experience, and they know that one of the goals of the project is to find a means to communicate effectively cross-culturally, they seem to interpret the course goals to mean that they must communicate without conflict, not realizing that conflict is often beneficial for developing better end products in collaborative environments (Lay & Karis, 1991). Although we have no intention of encouraging cross-cultural conflict, in the future, we will ask students to embrace conflict as a means to negotiate interests in their common projects and to help them see the benefits of working through the negotiation process.

Psychological Barriers

Another of the challenges of the Global Classroom Project has been students' lack of experience with the collaborative process, which has created psychological barriers, both for the Russian and American students. The American students, more often than not, have studied in technical fields in which collaboration is not valued and not taught, so many may participate in a collaborative project for the first time. The Russian students have no collaborative training, and find collaboration difficult and strange as a means of study. This lack of experience with the process creates a psychological barrier for all students that they must overcome in order to be successful in the course.

Students also find it psychologically difficult to work within a class where their grades are attached to collaborative projects and dialogic performance rather than to a search for specific "right" answers to questions. When a course subject is the students' experience, there are no right answers but only reasoned means to work with issues, problems, questions, and opportunities as they arise. For example, if students are working hard to develop a digital product that they thought they tested well, and they find that the technology in their partner location does not support it, then the students must reevaluate their situation, adjust, and find a solution. There is never a one "true" or "right" way to adjust to these kinds of problems, but only contextually based, logical, well-considered responses. Students' success is based more on their ability to adjust, sometimes creatively, than it is on succeeding in their initially proposed goals. Not unlike other kinds of experiential classes, students have difficulty becoming comfortable with the idea that their grades are based on less tangible factors than those that are a part of rote classes. They seem to face their greatest psychological tension with the process of cross-cultural collaboration itself. Despite our attempts to provide assurances and to give them as much "factual" basis for grading as possible, the tension persists. When responding to their experiences in class, students often note dissatisfaction that their collaboration was difficult, messy, or disorganized, and that the students in their groups did not respond as they expected. Where they see this part of their experience as a failure, we see it as a benefit in that this is often the process of experience that teaches them the most. Unfortunately, we feel our own set of frustrations in not being able to give students a tangible, fixed, "right" method for completing their projects. (For more detail, see *The Global Classroom Project: Trouble-Making and Trouble-Shooting*, where we treat these issues in great detail and attempt to explain how and why this happens in a course of this kind, how it reflects the nature of our field, and then point to the benefits and detriments of the kind of chaos that makes up an experiential course.)

An additional course challenge is that almost none of the Russian students have ever communicated over distance before and find it difficult to become accustomed to this new experience. Even the American students, who use e-mail constantly and communicate with friends across the country and the world, find it difficult to work online with students they have never met and have never seen. We try to alleviate these difficulties by beginning the semester with an exchange of digital photographs, introductions, and conversations, and in spring 2002, a graduate assistant designed and introduced an icebreaker exercise to help students become acquainted. But the problem still remains, and it may be just an aspect of this kind of communication situation that students must experience in order to become more comfortable in future communication settings.

The Russian students also experience a disparity of access to computers and the Internet that can overwhelm them at times. Personal ownership of home computers is still relatively rare in Russia because computers are very expensive for them and Internet access can be even more expensive for Russians than it is for Americans. The result is that the great majority of Russian students have access to the Internet, WebBoard, and to the collaborative process only during their class times twice a week. They are not able to peruse materials at leisure, and coupled with the challenges they face in using English as a second language, this can lead to frustration. The American students, even though they know and understand the circumstances of the Russians' lack of access, at times also become frustrated when they fail to receive replies to their posts with the frequency that they expect.

Although we have not experienced any problems from there being two instructors in one course, and although students seem glad to be able to ask questions from either of us, we remain aware that another area of psychological tension may result from course circumstances in which there are two professors. We are very careful not to give conflicting advice or assignments; there is only one joint class assignment for each section of the course, and each assignment is posted by both of us together. But we do our best to respond to all the students, both Russian and American equally, and it may be overwhelming to have the presence of two professors in one class. Naturally, the students have greater access to the professor of their own countries, and they look for the final word on issues from him or her. Again, although no problems seem to stem from students having two professors, it could be overwhelming to some students, so it is an issue to note.

Technological Issues

A global course necessitates the use of technology, although we prefer not to focus on it as an issue in itself. We use WebBoard web-based communication software as a tool for class discussion, as an information site, and as an archive of all the classes taught since the inception of the project. WebBoard allows us to provide one "place" in cyberspace that is the domain for all the students rather than for one group or the other. The software has been housed on a server at Georgia Tech, but is now located on and run from a server at the European University. Its actual physical location has no bearing on the sense of "place," either for students or instructors, but can affect our ability to handle technological demands.

WebBoard is accessible from any web browser around the world at any time of day or night in any time zone. It allows graphic upload and display, operating the same way that other websites do. We administrate the software ourselves, and are able to create and control the boards that we provide for each class as well as the conferences within them. WebBoard has provided a very stable, efficient connection that has never failed us over the time that we have used the software. Using WebBoard defeats the problems inherent in attempting to load multiple computers using different operating systems with the same or corresponding software. Bandwidth is an important consideration for us, because of Russia's limited bandwidth, even throughout the country as a whole. WebBoard does not require a high bandwidth connection and loads relatively quickly both in the United States and in Russia. Problems with other software often include that of paying for licensing fees as numbers of users increase, but WebBoard only requires a one-time payment for software and allows unlimited users.

For all its benefits, WebBoard's interface and conference arrangement can be difficult to use, and we hope to obtain funding that would allow us to develop and use our own graphic interface as an improved course tool in the future. WebBoard has an opening log-in screen that leads to a split screen, dual column interface, listing conference names on the left and reading/writing space to the right. Users can click on a conference name on the left to open it, then click on a post within it, which opens up on the right side of the screen for reading or response. Each post on the right side of the screen includes a menu that allows readers to reply and quote the post they reply to, reply without quoting, or to create a new post, thus creating a new thread within a conference. Despite WebBoard's complexity, it provides us with the most stable, most effective, and least expensive conferencing system we can find. Most important, it allows us global access and the ability to control and archive our own classes and course materials without interference from university or department technology operations.

As already noted, WebBoard is the "place" in cyberspace where we conduct classes, provide instruction and class information, and where we require in-class discussions and some of the group collaboration. But, students also use e-mail and sometimes telephone, as well as face-to-face meetings in their own countries, to supplement the work they do in class. We encourage e-mail use, but do not oversee it and do not require specific, consistent software use among students.

CONCLUSIONS

Despite the challenges, difficulties, and complexities of the Global Classroom Project, we have been gratified to see it develop and sustain itself since spring 2000. We have become well versed in what we call "mutual distance instruction," which requires a truly collaborative approach to course development, teaching, and assessment. In fact, any success we have had in this global course may be attributed to our determination to focus on the needs of all the students and the needs of both university structures, while taking into clear consideration the administrative, political, and psychological drives of all the elements of the project.

The project has expanded to involve student work from beyond the course instruction portion of the Global Classroom Project. One of our graduate students assessed the project as a basis for his thesis work for completion of his master of science degree in information design technology at Georgia Tech, and another based her digital thesis project on educational technology related to the Global Classroom. A team of graduate students working with the project developed a new digital tool for visual representation of assessment materials, and they have written a book chapter for *Online Education: Local Questions, Global Answers.* They also delivered a presentation on their work at the Fifth International Conference of the Learning Sciences (ICLS, 2002).

We continue to pursue our work with the Global Classroom Project with the belief that the experiential setting provides students with unique understanding of the processes of collaboration, cross-cultural digital communication, and humanistic cultural criticism and analysis. We also have no doubt that global interactions in the workplace, government, and in our own homes will only increase in volume, depth, and complexity, so we feel that students will continue to benefit from a project that grows to meet the demands of the future. We hope our project will continue to expand to handle these new demands. We are happy with the progress made to date and hope the epistemology, pedagogy, technology, and political structures that support the Global Classroom Project are well aligned to help it continue to move successfully into the future. We also encourage others to pursue projects of this kind to find their own means for working through the kinds of complex challenges that we face in our project. We are often asked what advice we can give to instructors with an interest in pursuing less ambitious projects. But we feel that if we can develop this kind of project, others can too, however ambitious it may seem. The project runs on enthusiasm, hard work, willingness to accept the inevitable difficulties and project failures, and hard-headedness to continue to push it along. These are just some of the challenges that members of our field and our students already embrace in their own work, and projects of this kind provide them fertile ground for their own new participation in technical communication teaching and development efforts.

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8

Redesigning Our Technical and Individual Screens: The New "Windows" Opened by Teaching in a Former Soviet Republic

Gil Harootunian
Syracuse University

It was pure imagination, probably traceable in the beginning to the lies circulated by Snowball. A few animals still felt faintly doubtful, but Squealer asked them shrewdly, "Are you certain that this is not something that you have dreamed, comrades? Have you any record of such a resolution? Is it written down anywhere?" And since it was certainly true that nothing of the kind existed in writing the animals were satisfied that they had been mistaken.

—George Orwell, *Animal Farm*

One of the key concerns raised in this volume is the need to devote more effort to analyzing the cross-cultural issues affecting technical communication, precisely because the World Wide Web is a global medium. As one of the few who have taught professional and technical writing in the Eastern republics of the former Soviet Union,[1] I offer some insights on the cultural issues that should inform the work of technical communicators in our global village. My months living in the post-Soviet culture and new nation of Armenia have made clear to me that current ways of framing questions about cross-cultural issues belie the infancy of our international understanding. My experience clarified for me that the truly critical

[1]Armenia is one of the Newly Independent States (NIS) that emerged from the dissolution of the Soviet Union. This designation is slightly different than the Commonwealth of Independent States (CIS), which is composed of those NIS that chose to form a confederation after the Soviet Union dissolved. Exchanges between the United States and the NIS have been rarer in the former Eastern republics, from Georgia, Armenia, and Azerbaijan to Uzbekistan, Tajikastan, or Turkmenistan, than they have with those of the former Western republics, like Latvia, or the Western satellite regimes, like Poland.

issues arising from cultural differences are the cognitive patterns that are shaped by and, in turn, shape the educational, political, and economic systems of any country. That we still discuss cross-cultural issues in our classrooms in terms of contrasting color preferences in varying cultures or by cautioning students against using American idioms in business letters for international clients indicates that we as yet blithely bypass the deeper ethical questions in our field. Doing so will limit our success as technical educators and practitioners in the global arena, but transcending these limits will enable us—and our students who will soon enter the professional world—to make a more effective contribution to educational, political, and economic realms intentionally. We must begin teaching in a manner that prompts us to investigate the truly significant differences in the cultures, economies, and politics of other countries.

I begin this argument by noting that the World Wide Web is, at least in the United States, an extension of our writing culture. For convenience, we make categories in the academy or elsewhere to facilitate study. These categories then allow us to focus on "technical communication" or "deconstruction theory" or "Freudian psychology." Although such categories are false but necessary to the advancement of knowledge, we should not lose sight, however, that they are embedded in a complicated grid of knowledge. My experience in the former Soviet Union prompts me to analyze technical communication within the larger web of the U.S. writing culture. Then I will look at the ways in which my exploration of the larger writing culture deepens understanding of the smaller field of technical communication. This is particularly relevant to the topic at hand in that our Western use of the Web is influenced by and in turn influences our model of democracy, for an advanced democracy like ours is a writing culture, and the Web is a critical extension of our democratic writing culture. This symbiotic relation between democracy and writing offers technical communicators a unique opportunity to serve as a limited but special force for creating democratic approaches to writing, and for disseminating and accessing information internationally.

Indeed, the primary perception occasioned by my sojourn as an American in post-Soviet culture is that a genuine and advanced democracy must be a writing culture, just as a totalitarian or otherwise oppressive state is in the main an oral culture. If I had one issue to raise with technical communication faculty and the new generation of technical communicators that we are preparing for our global workplace, it would be that we undervalue the role of professional and technical writing and technology in establishing and stabilizing democratic educational, political, and economic systems. The more that we study the ways in which our work, which involves global media like the WWW and professional forms like the e-resume, enables democratic systems and international economic advancement, then the more we can realize the genuinely ethical nature of language and technological instruction in the 21st century. I will begin by describing the cross-cultural context of my teaching experience in the NIS before moving on to clarify the differing cognitive patterns and experiences. Having done this, I will then draft a model of a new kind of international technical communication course geared to raise student awareness of their interfused roles as competent professionals and citizens.

THE CROSS-CULTURAL CONTEXT IN THE NIS

In September 2001, I landed at the Svartnoz Airport in Yerevan, Armenia, to begin my lecturing and research award as a Fulbright scholar. Most of the emergent nations in this huge geographic area seek to learn about the Western world and to enter the global, and, particularly, the new regional economies, and Armenia is one case of a new nation asking questions about Western systems: educational, political, and economic. Unlike many other Eastern republics that are mired in dictatorships, Armenia is struggling to become and remain democratic and to enter the international community. To realize this goal, she is working to bring her political, educational, and professional systems in line with international standards.

Surprisingly little to no work has been done in our field in these post-Soviet countries, although the need is immediate, even desperate, and the countries in the NIS have been open to American researchers for the last dozen years.[2] At the time of my Fulbright, I could locate only two articles. Steven (2000) and Rodman (1996) analyzed the need to bring Western professional and technical writing practices and genres to the Russian Federation and Latvia. These two articles also point toward our favoritism for the western part of this huge geographical territory. Where is the research on Uzbekistan, Armenia, or Georgia? It is true that regional conflicts have limited the access of American scholars to these countries, but these conflicts have been abating. Not only are countries like Armenia and Uzbekistan positioning themselves for leadership in this region, but in general these regions are opening up, and as the recent terrorist tragedy of 9/11 has shown us, we can no longer afford to ignore this chunk of our world; or even to leave them out of global communication and interaction, or out of the World Wide Web. The answer to the question, "Should technical communication faculty be going overseas to teach technical communication?" is a definitive "yes."

COGNITIVE PATTERNS AND EXPERIENCES

How many Americans have a working knowledge of the actual conditions in other countries—not look-alike countries like Canada or Australia or France, but truly

[2]The rare International Technical Communication (ITC) faculty have in general decried this fact. Spyridakis (2002), in her directions to students writing a research paper for her ITC course, stated, "Because there is a paucity of original research in international technical communication, you may need to use discussion articles at times, but make it a goal to find original research when possible. . . ." (See also Hoft's, 1998, references to readings necessarily taken from her "private library.")

"other" countries like Armenia, Khazakstan, or Kuwait? How many of us have firsthand knowledge of other cultures and the higher educational and workplace systems that these cultures generate? The provost at my university has announced a new academic plan, which includes every undergraduate at Syracuse University having an international experience before graduating (A Strategic Partnership). The situation reminds me of the arrival of technology in our classrooms, when students often knew more about computers than the teachers did. I postulate that this will soon happen in the international realm. Students will have traveled more than we have and will have more firsthand knowledge of the world than teachers, making those teachers who stand in front of the classroom and discuss "the world" seem, justifiably, ignorant. We must face some harsh realities about our abilities and limits when it comes to formulating principles and practices for teaching and for technology in our global ecumene.[3] Having been there, I would first share with technical communicators in the U.S. academy this critical issue: We must recognize that cultural and educational differences result in different cognitive patterns, and these can make our sharing of technological communication genres and strategies with citizens of other nations meaningless to them at times.

This situation runs true for teaching in the former Soviet Union, because that empire had an oral culture, which lingers in many new countries like Armenia. An oral system persists in her educational, political, and economic arenas. As the scholarship of Stevens (2000) and Rodman (1996) documented, in the political realm, this oral culture can facilitate corruption, because it leaves no paper trail and it allows for the tight control of information. In the economy, the oral culture undermines an open and merit-based competition, as democratic searches mandate that all the qualified can submit resumes, proposals, and like documents. In higher education, the oral culture positions the student to sit in lectures for a prescribed number of hours, then repeat memorized bits of knowledge during an oral quiz. Moreover, other researchers have described the ways in which citizens in largely oral cultures have different cognitive experiences and thus patterns that limit their ability to construct advanced analyses and arguments. Ong (1982) stated the case succinctly: "All thought, including that in primary oral cultures, is to some degree analytic: it breaks its materials into various components. But abstractly sequential, classificatory, explanatory examination of phenomena or of stated truths is impossible without writing" (p. 8). His work spurred substantial debate, involving multiple authors who explored the finer complexities of cognitive and educational patterns in oral versus writing cultures. The most relevant works regarding the post Soviet cultures are those of Rodman (1996), Stevens (2000), and Ornatowski (1996, 2001), who demonstrated that the political and

[3]Hannerz (1996), one of the original theorists on transnationalism, first urged us to cease to see the world as a "global mosaic," a set of bounded entities, and to begin to see the world as a "global ecumene," an interwoven set of happenings (p. 7).

economic conditions of the Soviet Union mandated in the main a corrupt oral culture. Also relevant are the works of Thatcher (1999), Salazar (2002), Daniell (1999), Street (1984), Cross (2001), Cope and Kalantzis (1993), and Wagner, Venezky, and Street (1999), who demonstrated the subtleties of communication in individual cultures, from national to corporate.

I entered Yerevan State Linguistic University (YSLU) to discover that oral culture still predominated. I initially thought that I needed to introduce the students to American writing strategies, theories, and skills. Meeting casual indifference and outright dismissal, however, I soon realized the challenge was severe. They had no identity as writers. This initial reaction did not match the resistance sometimes found in U.S. writing classrooms, whether in first-year composition or technical communication classrooms. American students might resent the heavy workload of research and writing, or be insecure about their research and writing abilities, but most are already citizens of a democratic writing culture; they accept and value apartment leases, labor contracts, résumés, business web pages, the nutritional information printed on all food products, and so forth, and so they know that some degree of mastery of written forms of communication is essential in order to perform in the United States. The Armenians did not feel this way. There was no need for résumés and such in the Soviet Union, for example, because in that state there was no fair and open competition for jobs and apartments (see Rodman, 1996; Stevens, 2000). Moreover, my students were reticent to write down their histories to produce résumés, because recording information and sharing it might give someone in power the ability to hurt you. *"Who is going to read this?" they asked me.* They feared that the KGB might come back.

I was struck that we Americans not only blithely write and post our résumés to companies and managers sight unseen, in the belief that we will be judged and rewarded on our merits and hard work, but we now load our e-résumés on the World Wide Web with faith in our audiences on an international level. Our writing culture has made Americans an open and trusting people who appreciate many forms of writing, especially creative and web forms, even if our students detest a few other genres such as the research paper with meticulous APA or MLA citations. Our U.S. perspective on communication and audience is far different from that of the Armenians and others struggling to recover from the paranoia inflicted and general damage done in the Soviet Union. In these oral cultures that facilitate corruption, the act of writing is usually reserved for abuse and control (i.e., for a KGB dossier). The complexity of the language culture of the Soviet Union cannot be described here, but work of a number of scholars has delineated the ways in which writing was used as a debilitating form of control. In a totalitarian state, the positive uses of writing can be marginalized to the counterculture. Books are censored, their authors exiled, and secret copies are then circulated—at great risk. Yegishe Charents, a poet of Armenia, is only one example of the intelligentsia who were labeled "radical" or "extremist," then arrested and shipped off to meet an early and brutal death under Stalin. Thus, citizens in other cultures have far more charged associations with writing than we do. We sometimes think of tasks like drafting an e-résumé as routine work, but teaching such forms is profoundly democratic. In those YSLU classrooms, their faces shone when the students finally grasped that the resume meant they had a chance to compete based on brains, not on whom their brother-in-law might be, or on the going bribe to secure a job. They envisioned a brighter future.

What are the other hard but inspiriting revelations unfolded in YSLU classrooms? During the second meeting that I had with students, I engaged them in an "American" group reading of a text. I divided them into four groups and directed each group to read one fourth of the text, then "teach" that part to the rest of the class. I stressed that they should record and present the "main ideas" and "key points" of the text. Like many in an oral culture, the Armenian students are extremely polite, especially to a person in a position of power or authority. They gave me no indication that they had little idea what my American directions meant. The students diligently applied themselves to the task, then rose and began reciting detail after random detail. This drove home two theories of Thatcher (1999) and Ong (1982): "oral" thought centers on narratives of accumulated detail, giving priority to exactness and transmission of detail; and oral cultures have "high distance" power relationships, with great sensitivity to the rank (professional or social) of the person within the collective. In other words, many in other cultures will not tell us that they find our requests and assignments incomprehensible—even meaningless.

On that first day, as I sat listening to these students from the perspective of an American communicator who concentrates on identifying, organizing, and illustrating abstract ideas, I was shocked that they attributed such importance to minor details. The immediate need, then, was to make explicit the connection between a writing culture that produces citizens with "written-like" thought and an oral culture that produces citizens with "oral-like" thought. Much discussion ensued in which I clarified the differences between these two modes of thought, noting that writing cultures value division and hierarchy of the main points and subpoints, each of which gain force through concrete illustration. I had to constantly make explicit the ways in which many exercises common to U.S. teachers push our students toward abstract, analytical, and argumentative cognitive patterns. I repeatedly clarified that a summary teaches the abstracting of key ideas; an outline makes one engage in the division, hierarchy, and development of key ideas; and concrete illustration gives just that to abstract ideas—a very different thing than the "detail" often drowning the cognitive screen in oral cultures.

The challenge was that the Armenian students still had no appreciation of what I meant, even after my explanations. I realized that I had to explain the differences through their perceptions. I'd been struck by the large number of art museums in Yerevan, so I used the culture's fondness for art to help the students enter in my discussion. I likened their "oral" thought to photographic art that captures every realistic detail as it tells a story from an individual's perspective and U.S. "written" thought to abstract art that captures "key" elements of the subject as it makes an argument about the essence of that subject. For the first time, recognition and surprised understanding registered on the students' faces. From then on, I could with success explain to them the purpose of U.S. academic, professional, and technical communication in contrast with their forms.

I also discovered that the oral culture inhibits sustained intellectual communication in a way that necessitates our making critical distinctions between "collective" and "collaborative"—individuals in an oral culture present their narrative to an immediate audience of warm bodies (i.e., the collective). The individual's impact can be but ephemeral, as the audience for the individual's story will disperse and one can never replicate that audience's context. If one thinks back to the "photographic" nature of oral thought, one soon realizes that a photograph is shot by a photographer (i.e., the individual story-teller). This means that the photograph does not present reality per se, but reality as the individual "photographs" it. The individual's—and audience's—perception of reality will change as the historical and cultural circumstances change. Ong (1982) remarked on the scholarship demonstrating this "structural amnesia" of oral collectives. The facts of the carefully written records of court disputes, genealogies, and so on, kept by British colonists were not reflected in the oral traditions of the local cultures, whose pasts easily mutated to fit the current local context (pp. 47–48). A "collective" is a mutable thing.

Sometimes we in writing cultures reflect nostalgically on lost golden oral narratives and heart-warming oral "collectives" without considering that writing enables another level of "collectivity" (i.e., collaboration). Cross (2001) studied a U.S. business in crisis to analyze and describe the ways in which writing can be used to foster an advanced level of inquiry (i.e., a collaboration of writers and readers). He observed that those meetings that lacked a written document as a center for discussion were failures. From one meeting where the leader desired to save "reams of paper" by not xeroxing a key document, Cross concluded that "this paper-saving 'good' was to prove the enemy of the best, however, as the meeting foundered when there was no common model to serve as a point of reference" (p. 41). Other research has shown that when orality becomes the basis of business communication, sustained inquiry is rendered nearly impossible. For example, Thatcher (1999), teaching the generally accepted accounting principals in South America, realized that many of the South Americans devalued and even resented collaborative work. The participants were each stuck in the identity of a dramatic individual story-teller for an oral collective, and had not developed the necessary alternative identity of a written collaborator. They needed to switch into the latter role to realize a better individual performance in the complex and advanced researching and writing tasks of the global workplace. In many ways, a common textual reference, and the sharing of that reference via forms like Lotus Notes, helped to focus the group's mental inquiry and prompt sustained and collaborative intellectual inquiry. The same phenomena arose in my own experiences in Armenia.

Ong expressed the capacity of "collaboration," thus:

> It is the oral word that first illuminates consciousness with articulate language, that first divides subject and predicate and then relates them to one another, and that ties human beings to one another in society. Writing introduces division and alienation, but a higher unity as well. It intensifies the sense of self and fosters more conscious interaction between persons. Writing is consciousness-raising. (pp. 178–179)

Consciousness-raising—what a promise for writing in the new millennium.

THE DIAGNOSTIC PARADIGM

Clearly we need to be better prepared to teach international technical communication in cultures very different from our own. We need to move beyond focusing on the usual cross-cultural issues, like colors or idioms,[4] to address the educational and political ones, like cognitive patterns and forms of government. We cannot naively expect that the Web will work in other countries as it has in the United States. And we need to be careful about romanticizing a writing culture and its democratizing potential. For instance, we can look at Nazi Germany. Germany was among the most advanced writing cultures of its time, and its Nazi regime continued this unabashedly for its own ends. The Nazis welcomed the writing culture's potential to advance its goals, as when it kept the regular procurement process (i.e., open and documented bids and contracts) to buy the gas for the concentration camps.[5] Advanced democracies would likely be writing cultures, but advanced writing cultures need not be democracies. And although the Web has democratizing potential, it too is not sufficient for democracy. It can be used in a variety of ways, for a variety of ends.

My experiences and insight in the classroom were reinforced by interactions with Armenian faculty and teachers. One vivid instance involved PowerPoint presentations at the 2001 Education Conference, sponsored by the U.S. Embassy in Yerevan. I gave a PowerPoint presentation on the differences between oral and writing cultures. My presentation was typically American: light background, darkish blue font, three or four key points abstracted for each slide, each slide sequenced to present a complicating thesis. The slides of the Armenian teachers made evident not abstract but narrative thought. Each slide offered a crammed list of details that combined to tell "one" story. Moreover, the slides also exhibited the

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[4]Chu (1999) noted that we rarely have enough context to make informed decisions about seemingly simple issues like the use of color. Giving a detailed explanation on the varying meanings of white, red, and green in Chinese culture, he concluded that only those technical communicators who have conducted usability testing with local persons in a culture can make accurate decisions (p. 18).

[5]Ironically, this paper trail left by the Nazis later facilitated their prosecution and conviction during the Nuremburg Trials.

bright colors and flourishes so beloved by the East. Over a dark green background with canary yellow swirls, many points were compacted into one slide. The prominence of the canary swishes can rivet our attention, leading us to focus erroneously on cross-cultural differences in design. The underlying and serious issue, however, consists of the cognitive patterns that make the designers cram a list of details into one "story" slide instead of abstracting key principles for one slide, sequenced with others, to create an evolving analysis or argument.

Prompted by this view of PowerPoint practice in the culture, I examined the websites of three major universities in Armenia (American University, Yerevan State University, Yerevan State Linguistic University). Before noting the results, however, I would clarify that universities are only one pocket of writing in any nation, for they house the intelligentsia. Furthermore, those engaged in designing university web pages would be among the most proficient technical communicators in a country. Armenia's university web designs exhibited these features:

1. They featured static blocks of black text (like a written page).
2. Visuals were not integrated with the text. They were regulated to one spot, as they would be on a written page, and they represented static objects such as main buildings, a stone carving, or a solitary stone bust of a male genius. The sites offered little opportunity for interaction.
3. The pages featured links on a left sidebar or a bar across the top or bottom. These items were attached to a written page, not integrated within it.

However, when I visited sample sites from technical universities in Yerevan, for the scientific community has always been one of the most internationally competitive and networked, I found that the designers of these sites had begun to treat the web pages as "free" and evolving space, with text and a few visuals complementing one another, or with a static list of three dated news events. The web pages of scientific fields seemed to manifest their greater participation in the global village (see Yerevan Physics Institute, Yerevan State University of Architecture and Construction, Yerevan State Medical University, and State Engineering University of Armenia).

How can such understandings further deepen and broaden a technical communicator's performance in cross-cultural situations? I was baffled, when I first arrived in Yerevan, to find that advanced U.S. websites struck Armenians as undignified. Why would Armenians think that U.S. websites are not dignified? To understand this, a technical communicator must consider the cultural context, and then look at Armenian websites. One notes the stone bust of a male leader or the grandiose facade of a university. Here are the traces of totalitarianism—the huge busts of Stalin or Lenin, and the ancient palaces of Eastern kings and queens. To an Armenian professional, this is dignified. One can see the resemblance to websites of universities in Moscow: Bauman Technical University, Moscow English Physics Institute, Moscow State Institute of Electronic Technology, Moscow

State Technical University of Civil Aviation, and Moscow State University. The U.S. websites featuring the informal array of people in a community, each in his or her own dress and attitude, would strike the Armenian sensibility not as democratic and collaborative, but as common and undignified, particularly so for a center of higher learning (see websites for Columbia University, New York University, and Syracuse University). Conversely, the Armenian website might strike Americans as stiff or snobbish. Study of the culture's existing websites or other related texts enables technical communicators to better assess the work of their own and of other cultures, then make any serious cross-cultural issues explicit for discussion among themselves and their clients. This can only increase our chances of success in cross-cultural endeavors. Such perceptions position technical communicators to make more informed judgments about their professional decisions.

I conclude with a movement from our technical screens to our cognitive screens. On my return to Syracuse University, many of my U.S. colleagues asked me questions: such as, did I know Russian and how difficult was it to read and write the Cyrillic alphabet? Even after I repeated that the Armenians spoke and wrote Armenian in the Armenian alphabet, a few could not grasp my point. We Westerners see through a "superpower" terminal screen. I constantly hear other Americans refer to the ex-Soviet Union as "Russia," but the ex-Soviet Union is not "Russia." The ex-Soviet Union consists of a dozen new nations, only one of which is not "Russia" but the "Russian Federation" of a diverse ethnic and cultural mix. We are so much more comfortable with "seeing" the ex-Soviet Union as one big cultural unit of Russians, a White and Christian people. How can we hope to objectively analyze technology and its teaching in the global village when we still cannot realistically "see" that global village?

I cannot stress enough how my experience, and the reactions of my U.S. colleagues to it, made me aware that our present terminal screens may significantly limit the success of our work. Fulbright and similar grants for international education are grossly oversubscribed in chic places like London, Paris, and Florence and equally undersubscribed in foreign places like Tashkent, Yerevan, and Tbilisi. I use the word "foreign" to again highlight the infancy of our international outlook. We readily apply the word "international" to cities like Paris and London, but don't cities outside the West remain "foreign" in our minds? The most glaring ethical implication here is that we simply refuse to leave our luxury Western comfort zone to do our work in other regions, and the less glaring ethical implication is that we soothe our consciences by sending funds in lieu of ourselves. But we cannot continue to just give them computers and, perhaps, distance instruction; we need instead to discover with them the language cultures that are influencing a given population's perceptions, cognitive patterns, and use of technology and technical communication.

Chu (1999), another international technical communicator, similarly tried to break through the cultural and political boundaries that inscribe our cognitive and technical screens. He arrived at this argument: To fully realize the democratic potential of the WWW, technical communicators must address the dilemma that the WWW has made technical documentation and communication globally accessible, yet genuine intercultural and multilingual Internet technologies are neither available nor mature. In the meantime, we should not just use clip art of a paper lantern and think we have achieved "intercultural" web design. Instead, we should strive for both increased sensitivity and creative solutions to the problem that English is the de facto language of the Web, but there are 100 languages on it, and there is not optimal translatability between English and other languages. We should try to answer this uncomfortable "Big Question": Without universal language, can the Web ever be anything other than just an international delivery system; can it be an international medium? In short, genuine international work in our field has only just begun, and on-site international experience in our field is needed to productively problematize and prepare technical communication for the global village in the 21st century.

Other scholars like Rodman (1996) and Stevens (2000) chronicled that educators and professionals in the NIS are eager to learn the document types required for international business transactions and to comprehend Western writing issues, such as the need to persuade an audience or the standards of detail and accountability in business documents. Will we ever have as huge, eager, and new an audience for our work as we do now? Will we let pass this window through which we can make technical communication one source of energy for a more democratic new millennium?

THE NEW INTERNATIONAL TECHNICAL COMMUNICATION COURSE

What happened to my pedagogy on my return to Syracuse University? I began to experiment with designing a new international technical communication (ITC) course, one that is not a mere academic study of the global workplace but a genuine exercise in understanding international ventures and communication. I had stepped outside the boxes of technical communication or American communication. These moves prompted me into a further one: I stepped outside the box of my writing program. This was a necessary move, because I, like many others, teach in a writing program that functions and is perceived by others as a service program in our university. We have no independent degree in technical communication, for instance, and therefore I had to think of designing an ITC course that met the needs of students outside the writing program, in other degree programs across the campus. In the end, I found myself piloting the course in the summer institute for international students in Syracuse University's School of Information Studies.

For these students, whose future career would position them to work in the international arena, my first goal was that the ITC course should not focus on standard phenomena in cross-cultural pedagogy. Previously, I had diligently asked students to read the textbook's sidebars: "... be aware that the significance of colors change from culture to culture" and "... do not use idioms in business letters outside the U.S." This blinded me to the fact that I should have been focusing on the real phenomena of *inter*national issues and ventures. While in Armenia, I witnessed actual international agreements and work. Many of these were within the region—ventures with nations like Russia, Italy, and Greece—but there were also some with nations throughout the world, like Korea's Samsung. There were also various enterprises with the United States, such as the Lincy Foundation entering into an agreement with the Armenian government to rebuild the country's crumbling infrastructure. Marriott International bought Hotel Armenia in Yerevan's central Republic Square. One U.S. Protestant church established a program to train villagers, who had been standing all day on the road in front of the long abandoned collective farms, to plant apricot trees, then harvest, dry, package, and export the fruit. An Armenian entrepreneur who had studied in the United States founded "Grand Candy" in Yerevan and proceeded to export to California.

These current and actual ventures became the focus of the new ITC course, and I then designed the course to move students from (a) researching, conceiving, and proposing a realistic international work project, through (b) designing successful WWW work for that project, and, finally, to (c) writing a white paper for the Web to investigate the larger social issues relevant to or even generated by their kind of international project.[6]

In the first of these three sequenced units, "Proposing an International Work Project," the students research actual international enterprises, via sources like http://www.bisnis.doc.gov (the "U.S. government's primary market information center for U.S. companies exploring business opportunities in Russia and other Newly Independent States"). Once logged onto such sites, students discover the realities of current international work projects. They will find that the diamond processing industry is the most promising for U.S. investors in Armenia, that iron and steel products comprise the main trading between the Ukraine and the United States, or that platinum, crab, and vodka are growing enterprises between the Russian Federation and the United States.[7] From this research, students identify a kind of international work project that they might like to explore in depth. This may be an extension of an already existing venture, such as expanding the market

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[6]I would like to heartily thank Wendy Bousfield and Nancy Pitre, two librarians at Syracuse University, for providing so much information and guidance on researching these international projects, to myself and to my students.

[7]Three other good sources are http://www.ita.doc.gov for the latest briefings from the International Trade Association; http://www.commerce.gov for the U.S. Department of Commerce's latest postings on trading opportunities for American business; and Primedia Directories' *Official Guide to Exports* (usually found in any major university's library).

for Surge soda into Australia, or it may involve designing a new but realistic venture, such as a joint water purification project between the United States and Costa Rica, or a bridge-building project between the United States and Canada.

The research, writing, editing, and presentation of all technical communication work during the semester arise from this choice of a realistic international work project. The students are then prompted to research the existing conditions of the foreign partner nation involved in the project with the United States. They are directed to write a "country profile" on the foreign partner's cultural, economic, political, educational, and technological situation. I also require that students attempt to ascertain the other country's public policy on WWW use, and that this "country profile" be based on actual models. I guide the students to models like the U.S. Department of State's "Background Notes" on nations throughout the world (www.state.gov), the "World Factbook" of the U.S. Central Intelligence Agency (www.cia.gov), and similar sites of the governments of the partner nations. Students are asked to address questions such as the following: Is the nation a democracy or a dictatorship? Is it a market economy, a subsistence economy, or a command economy? Is its educational system secular, religious, or elitist? How do these situations shape the government's public policy on WWW use and access?

Students next research and write a "company profile" of the company or organization that will engage in the international exchange, be it Absolut vodka, Crest toothpaste, or the World Health Organization. When this task is complete, the students will have developed so far a realistic international work project, a "country profile" of the partner nation, and a "company profile." This work has positioned the students to begin making informed choices about designing technical communications for all stakeholders in the project. In short, students are prompted to acquire as realistic as possible a context for their technical communication work in the second unit.

In this unit, students begin by focusing their research on the relevant, existing international technical communication (i.e., by sampling the websites of the company and foreign partner nation participating in their proposed projects). Students study the textual and visual patterns of each WWW site. They look for patterns in the WWW work that might reveal something about each culture's presentation of knowledge, its relation to participants, or its sense of time or space. When students have finished this effort, they pose questions about the assumptions that might affect the design and reading of WWW work relevant to their project. In the case of a United States–Kazakhstan joint venture, students might raise questions about positive or negative reactions that U.S. citizens might have about common design approaches in Kazakhstan; and they might look into responses that Kazak citizens might have affecting their reading of websites in the United States. As technical communicators, how would the students constructively apply this new knowledge in a real-life venture? How would they make a Kazak website convincing to U.S. readers? How would they make the U.S. website appealing to and suitable for Kazak viewers? Finally, at this advanced point, students draft a business proposal outlining the parameters and the merits of the project and its anticipated technical communication work.

In addition to this research and writing in the second unit, the students read case studies written by international technical communicators. An example would be Steven Chu, who worked for a market research firm in Taiwan. He wrote "Using Chopsticks and a Fork Together: Challenges and Strategies for Developing a Chinese/English Bilingual Website" (1999) as an ongoing case study of his team's effort to compose a genuinely bilingual and bicultural website. Chu covered topics ranging from technological challenges to differing participant responses in a variety of cultures. The students would then be asked to apply the different theories in such case studies to their own anticipated WWW projects. They might sharpen their focus on differing participant responses, technological issues, cultural questions, or a country's public policy that is relevant to their work. When this task of applied theory has been completed, the students design their own work, and soon present this WWW work to the class. They are expected to field questions from their peers on the international contexts that influenced their design.

In the last unit, the students begin probing the social implications and issues surrounding the web communication generated by their international work project. They are asked to draft a white paper for the Web on a current question—political, educational, economic, and technical—related to or even created by their kind of international work project. When they present this web document to their peers, the students field questions about the international context that affected their decisions. The following might be sample questions: How did they reach their decisions to arrange the information on this white paper website? Why are the graphics handled as they are—perhaps informative, decorative, or a combination? Or, what overall tone did they take, and what might this reveal about their assumptions regarding visitors to their websites?

In conclusion, the goals of the ITC course are to guide the students to learn about the significant international issues that they need to know right now to do technical communication in the global workplace, for all of its citizens. I begin the course by telling my students the story of George Soros, the international financier and billionaire dedicated to funding democratic international projects. In pre-WWW days, Soros invested in sending truckloads of xerox machines to Hungary, the repressed country in which he had spent his youth and from which he later fled. Soros realized that the dissemination of information was the most profoundly revolutionary act. The only other American with me at Yerevan State Linguistic University was a teacher in Soros' new Civic Education project for the former Soviet republics. That teacher's work involved organizing public conferences for the Armenian students and teachers to come together, discuss, and debate on democratic issues. The World Wide Web similarly offers an opportunity to enhance the democratic environment. Our courses to students in the United States can raise consciousness about international communication for and with such global environments, and perhaps accelerate the process of democratization in the global community.

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9

Ethics and Technical Communication in a Digital Age

Laura J. Gurak
University of Minnesota

Communication in this era of digital technology, multiple worldviews, and visual information is no longer simply about putting words on paper. In fact, it is not even about putting words on the screen, but rather about creating messages that address specific audiences using words, visual information, various media and delivery mechanisms, shapes, and sounds. Online communication is quick, reaches millions of readers, makes it difficult to know who the author is, and lets readers and writers interact with each other. Technical communicators are in close contact with digital technologies and the implications of such technologies for everyday communication.

Such communication requires the working technical communicator to make ethical choices, which can be as simple as what color is most appropriate for what audience or as complex as whether to include a certain piece of information or link. Ethics in the Internet age can be understood by considering more broadly the ethical choices involved in the use of the computer. Whenever humans invent and build a technology, they build in values, even if they do not intend to. Communicating in the digital world, for example, requires writing that is short, easy to read, and quick to download and process. These values thus set up situations that involve ethical choices. If you are asked at work to write a memo that involves a sensitive subject and send out this memo via e-mail, then the power of speed and efficiency may cause you to send the memo before you take time to consider how it will make people feel, whether or not all the facts have been checked, and the like.

This chapter explores ethics for technical communication in the digital age. This chapter first provides an overview, then gives specific examples to illustrate its point. The chapter also notes the difference between legal choices and ethical choices.

ETHICS AND TECHNICAL COMMUNICATION

Much has been written on this topic. In general, such treatments, either as sections in textbooks or as entire specialty books (e.g., Dombrowski's, 2000, *Ethics in Technical Communication*, or Allen and Voss', 1997, text of the same name), begin with an overview of ethical systems. Such an overview is useful in that it helps orient the reader in general systems of ethics. For example, Gurak and Lannon (2003), offered discussion of the following general systems of ethics: the categorical imperative, utilitarianism, and ethical relativism. Consider a brief summary of each:

Kant's categorical imperative—Immanuel Kant (1724–1804) argued that certain ethical situations dictate certain actions. Kant suggested that "codes of conduct and morality must be arrived at through reason and be universally applicable to all societal environments at all times." Kant emphasized the individual's responsibility and the intention of the act, not its consequence (Fink, 1988, p. 7).

Utilitarianism—Associated with John Stuart Mill (1806–1873), this ethical principle asserts that "ethical conduct should aim at general well-being, creating the greatest happiness for the greatest number of people." Unlike Kant, Mill argued that the outcome, not just the intention of an act, determined how one judged the ethics of that behavior (Fink, 1999, p. 7).

Ethical relativism—Taken to its extreme, ethical relativism suggests that any act may be ethical, depending on the particular ethical, religious, and cultural stance of the individual or group. A more moderate approach to relativism would suggest that acts need to be considered not against some fixed set of standards, such as Kant's notion, but in the context of the culture and individual circumstance. More recently, some would argue, U.S. culture in particular has gravitated toward a relativistic position regarding ethical behavior (Gurak, 2001; Lannon, 2000).

These and other ethical systems are sometimes grouped into two categories: foundational and nonfoundational (Markel, 1997). Such broad ethical principles, however, rarely provide sufficient guidance for the countless ethical decisions we face in the science and technology workplace. Kant's codes of ethics or Mills' utilitarianism might have been useful in their given periods of history, but today, most philosophers and ethicists agree that in a complex world, it is more effective to consider the particular situation and to develop standards appropriate for that situation.

Gurak and Lannon did note that technical communicators might wish to consider an approach based on *reasonable criteria* (standards that most people consider acceptable), which take the form of obligations, ideals, and consequences (Ruggiero, 2003, pp. 33–34; Christians, Tackler, Rotzoll, & McKee, 1978, pp. 17–18). *Obligations* are the responsibilities we have to everyone involved, for example:

- Obligation to ourselves to act in our own self-interest and according to good conscience
- Obligation to clients and customers to stand by the people to whom we are bound by contract—and who pay the bills
- Obligation to our company to advance its goals, respect its policies, protect confidential information, and expose misconduct that would harm the organization
- Obligation to coworkers to promote their safety and well-being
- Obligation to the community to preserve the local economy, welfare, and quality of life
- Obligation to society, to consider the national and global impact of our actions

When the interests of these parties conflict—as they often do—you have to decide where your primary obligations lie.

Ideals are the values that you believe in or stand for: loyalty, friendship, compassion, dignity, fairness, and whatever qualities make us who we are (Ruggiero, 1998, p. 33).

Consequences are the beneficial, or harmful, results of actions. Consequences may be immediate or delayed, intentional or unintentional, obvious or subtle (Ruggiero, 1998, p. 33). Some consequences are easy to predict; some are difficult, and some are impossible (Gurak, Lannon 2000).

A more sophisticated approach is that offered by Allen and Voss (1997), who suggested a "value analysis" (pp. 23–36) for defining and prioritizing values. The authors, who noted their involvement with the Society for Technical Communication's (STC) national ethics committee (p. 37), offered "ten basic values" based on their knowledge of the profession and on the code of conduct of the STC and other organizations. These 10 are honesty, legality, privacy, quality, teamwork, conflict-of-interest avoidance, cultural sensitivity, social responsibility, professional growth, and advancement of the profession (p. 38). In addition, Dombrowski (2000, pp. 57–74) updated the classic approach to ethics by adding feminist ethical stances plus discussions of ethics from the Confucian, Levinasian, and Gertian perspectives.

Such general systems and concepts are useful as an introduction, and seem obligatory to consider when discussing ethics, but there are two ways in which ethics can be more fully taught and understood. First, one can focus on a specific subset of ethical issues: in the case of this chapter, ethics and digital technologies. Second, one can ground such discussions in case studies and examples. Many of the textbooks and full books on this topic follow this model, offering case examples to support their points.[1] The rest of this chapter offers my suggested case examples based on my years studying and working on technical communication and Internet studies. But first, I review the cases commonly used to teach ethics and technical communication, so as to contextualize the cases I wish to present.

CASES INVOLVING ETHICS IN TECHNICAL COMMUNICATION

There exists a range of cases that are commonly drawn on to illuminate the general ethical approaches (mentioned earlier) by example. Most common among these is the case of the Space Shuttle Challenger, famous among technical communication teachers because of the "smoking gun" memo where an engineer was told to "take off your engineering hat and put on your management hat." This case is cited in the Gurak–Lannon text, several other texts, the Dombrowski (2000) book, as well as numerous papers and essays. From an earlier time, a similarly popular case involved the near-meltdown of the Three Mile Island nuclear facility, where again, a memo and its author were implicated for not being direct enough in their observations about potential technical failures. Another widely cited example is the work of Katz (1992; cited in, among other places, Dombrowski, 2000), who analyzed the memos of Nazi engineers and medical personnel, noting the "masked language" (Katz, 1992) used to cover up the true meaning of what was being done to millions of human beings during the Nazi regime. This discussion leads to a broader analysis of how word choice and use of language can convey—or cover up—meaning, and how the guidelines often given to technical writers for clear, accurate prose can also result in a form of poseur-neutrality, masking the truth.

More recently, cases such as the tobacco trials, Enron and other corporate scandals, global warming, genetically modified foods, and human cloning all have been used to explore the ethical issues involved in communicating scientific and technical information. Each of these cases is useful in a particular context, depending on what is being taught and discussed. For the purposes of this chapter, I drill down to a focus on digital technologies.

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[1]For example, Dombrowski (2000) offered case studies in Nazi records, tobacco trials, strategic defense systems, and government ethics. Allen and Voss (1997) offered case studies in technical writing, e-mail, toxic chemicals, engineering, and publishing.

ETHICS, TECHNICAL COMMUNICATION, AND THE DIGITAL AGE

As mentioned at the outset of this chapter, one of the most compelling sites to examine when discussing ethics and technical communication is the Internet. When we focus on ethics in a digital age insofar as these ethical choices affect technical communicators, we find a range of issues and concerns that one might easily argue define a large part of the ethical landscape of the coming century. As a background to these issues, let me suggest four key terms of the digital age—speed, reach, anonymity, interactivity—that set the stage for ethical issues. *Speed* defines our digital life. We press keys and send messages with little thought and little effort. These messages reach more widely and with less hierarchy and gate keeping than any technology in the past. We struggle with *anonymity* and identity in a world where the message can be created by a person or a robot. And we can interact with information in ways never before possible. Note how these features[2] set the ethical stage for concerns about privacy, technical accuracy, intellectual property, international issues, whistle blowing, and more.

PRIVACY

In *Cyberliteracy* (Gurak, 2001), I note the paradox of privacy on the Internet by using two cartoons. The first is a now-famous cartoon of two dogs, one sitting at the computer, the other looking on. The dog in the driver's seat notes to the other, "On the Internet, no one knows you're a dog." The point of this cartoon is to illustrate the perceived notion of privacy and anonymity on the Internet—you can be working in private from home, from work, anywhere, and no one knows who you are. However, in a cartoon that followed several years later, a second frame is added, and the computer speaks back to the dogs, noting all of the websites they have surfed, what they purchased, and what else is known about their spending habits. These cartoons serve as a good starting point for illustrating privacy as an ethical issue for technical communicators. First, many technical communicators will find themselves involved in the early design decisions of a product or application. Very quickly, the designers and engineers face a question: How much should they allow the system (software, hardware, GIS, phone—the system is not important to this discussion) to "spy" on the end user? And, how much should they tell users in the online privacy statement, documentation, or other consumer materials?

In addition, the privacy choices built into U.S.-based technologies and documented by technical communicators are often at odds with other cultural norms. The European Union's Data Privacy Directive, for example, makes it illegal to col-

[2]These features are articulated in detail in the book *Cyberliteracy* (Gurak, 2001).

lect personal information without first asking permission from the consumer ("opt-in" vs. "opt-out"). Is it ethical to impose one's own culture on another through the hard coding of certain values into technologies? These questions go beyond the Internet and encompass all digital technologies, from cellular phones to airport security. Technical communicators should be aware of the privacy implications of the technologies they work on.

TECHNICAL ACCURACY: WHAT YOU READ IS NOT ALWAYS WHAT YOU GET

Technical communicators are always told to be accurate. But sometimes you can be accurate while at the same time you leave out important details or make the information hard to find. Online privacy policies are a perfect example. Take a visit to any of your favorite websites, and look at the link to the privacy policy. In the Fig. 9.1 from Amazon.com, the privacy link is a very small link at the bottom

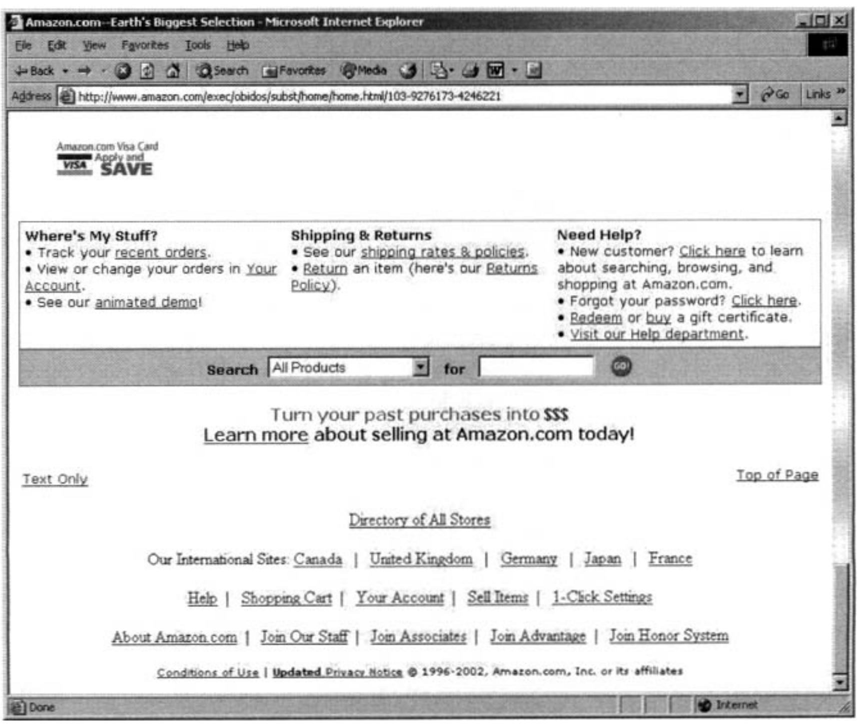

FIG. 9.1. The privacy notice on most ecommerce sites is located in small type at the very bottom of the screen, not the most obvious place a user will look.

of a very busy page. Would this be the first link a user visits? Probably not. This design choice is the same on many ecommerce sites, and it is certainly purposeful. Then, when users visit the link, they find a classic case of "information overload," with so much detail about online privacy that they probably won't even bother reading. What are the ethics involved in choosing how to write such a policy and where to place it on the page? Which comes first, the end user or the company?

In addition, the Internet, by its speedy nature, encourages a form of writing that is short, chunked, and to the point. But sometimes, this type of writing can leave out important details. Yet, on the other hand, we know that readers do not want to focus on long passages of information online. Ethically, technical communicators should be concerned that readers get the information they need. But do we have the training and theories at this time to help us best structure and write information for the Web? Figure 9.2 is part of the Amazon.com privacy page. Even with the use of bullets, the text is long and the concepts are more legal and technical than most readers can handle.

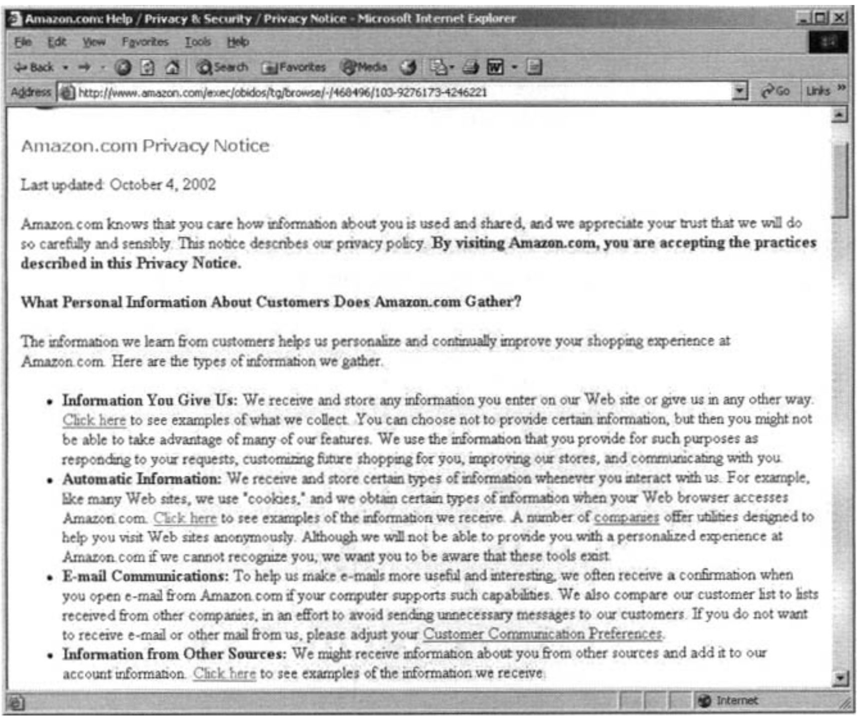

FIG. 9.2. Amazon.com's online privacy information.

COPYRIGHT, FAIR USE, OWNERSHIP: A TECHNOLOGY OF FREEDOM, A POWER STRUCTURE OF OWNERSHIP

As noted by both Porter (chap. 11) and Logie (chap. 10) in this collection, the Internet is raising serious questions about how we maintain our right to fair use against the rising and powerful tide of corporate information holders. The Internet, built to be nonhierarchical and made for file sharing across boundaries, has struck fear into the hearts of publishers, recording companies, and the movie industry. Instead of embracing and working with this new technology, they are heavily lobbying Congress to put as many stops in place as possible. The lengthening of copyright's term to life of the author plus 70 years (see discussion of the Sonny Bono Copyright Extension Act in Porter, chap. 11, and in Logie, chap. 10) is just one of many attempts to stop, for as long as possible, the power of the Internet for file sharing.

Where do technical communicators fall in this debate? As Porter noted, "It is increasingly important for technical communicators and their teachers to consider the ethics of public interest." If all information is owned in perpetuity by corporate copyright holders, then the public's ability to be creative and exercise free speech becomes curtailed. Educational work comes to a grinding halt. Technical communicators can educate themselves in this area and work within their organization to promote intellectual property agreements that serve both the organization's and the public's interests. (See Porter, chap. 11, and Logie, chap. 10, for more on this topic.)

INTERNATIONAL COMMUNICATION AND CULTURE: IS ENGLISH THE TECHNICAL LINGUA FRANCA?

Technologies are not value neutral. They bring with them the values of the people who create them. Take the Internet and other digital technologies, with their speed and broad and wide reach across boundaries of all sorts. Although there are some attempts at internationalizing these technologies, it is increasingly apparent that to know the Internet, you need to know English. And, U.S. values of individualism, freedom, and "electronic rights" are part of the backbone of Internet culture. Some have argued that this will help bring democracy to other cultures, but others note that this is a form of technoimperialism. For example, some cultures value collectivism over individualism. Is it possible to build hardware and software that does not favor the individualist tendencies of cell phones, computers, and the Internet? Can technical communicators play a role in helping shape technologies that welcome all cultures?

In addition, writing documentation in English is fine, but most technical information these days must be translated into multiple languages. The Internet then makes it easy to put documentation on the Web, with links for different language versions. But the Internet cannot do the translation (not yet, anyway). Writers must write in a style of English that is most easily translated. This approach requires companies to invest in content management systems and skilled translations services. Ethically, technical communicators should be concerned with making information accessible to all, but this goal may require hands-on involvement with managerial level decisions.

Dragga (1999) noted that whereas "research on intercultural communication does a good job of encouraging a sensitivity to international audiences," such research "elides the philosophical perspectives that inspire [diverse cultural practices]" (p. 365). Understanding the ethics of international communication practices, he suggested "requires of us the heavy lifting of studying and explicating the ethics of individual civilizations" (p. 366). Thus, rather than a one-size-fits-all approach, technical communicators would do well to take Dragga's advice and learn about individual cultures and their particular ethical systems.[3]

WHISTLE BLOWING: TELL IT LIKE IT IS?

In this post-Enron world, whistle blowing is a topic of discussion at many levels. Technical communicators often turn back to the Challenger and Three Mile Island cases, noting that in each instance the engineer who wrote the "smoking gun" memo did not do so as strongly as he might have; thus, the serious problem was not brought to anyone's attention at a high enough level. Allen and Voss (1997) noted the inherent problem with whistle-blowing: It goes against the fundamental human value of loyalty, a value especially prominent in corporate culture (p. 28). Any of us who have taught know that when young students are first presented with ethical case studies, their first response often is "Well, if I am getting paid to do it, I will just do what I am told." It takes much discussion of specific cases and examples before a teacher can crack the shell of corporate neutrality.

E-MAIL: WHAT GOES AROUND, COMES AROUND

It would be easy to write this entire chapter on the ethics of e-mail. What was once the exotic technology of academics and the military is now as common as a toaster. E-mail challenges us on many levels. The speed and reach of e-mail have changed forever the genre of the business memo. E-mail has changed the way we write, the use of capital letters, our sense of brevity, our sense of formal language. From an ethical perspective, it might be most useful to consider that e-mail is boundless, crossing space, time, corporate structures, hierarchies, and international borders, often with a few small keystrokes. What you say may haunt you

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[3]Dragga (1996) studied the ethics of China and Chinese philosophy.

forever in the digital realm. And notice how I phrased this last sentence: what you "say" versus what you "write." E-mail is a hybrid of both spoken and written communication, and because of this, it invites us to "write" in the way we speak: quickly, without regard for spelling and punctuation, and, importantly, without concern for the longevity or what Kaufer and Carley called the "fixity" of the communication. Spoken discourse is here today, gone tomorrow. E-mail is theoretically here forever. So the angry e-mail you whip off at the end of a busy work week may show up in your next performance review or on the desk of the CEO.

Ethically, it is important to learn to balance the seduction of e-mail's speed with the realities of its reach. You may say something on e-mail that is based on hearsay, or you may have some hard facts about a corporate scandal that you wish to anonymously send out to the world. In either case, you may press "send" before taking the time, as one would with a paper document, to consider the implications of your decision. And, you may think your e-mail is anonymous, but anything can be tracked down, and if a court orders it, most Internet providers would have to reveal your identity.

E-mail is also being used for routine communication tasks such as collaboratively editing documents and making group decisions. The impulse to write (speak?) quickly can often help create messages that are taken the wrong way. Even in professional corporate settings, flaming can and does occur. From an ethical perspective, technical communicators must consider the goodwill of their colleagues before sending a seemingly simple e-mail message that could cause chaos and hard feelings.

PLAGIARISM

The Internet encourages us to reuse material. If you see a Web page that looks nice, you can simply press "view source" to see the html coding for that page. With a few mouse clicks, you can copy and modify that source code for your own page. Likewise, when researching a topic for a paper, students can find all they need and more by using a search engine. With a few cut and paste moves and a few small changes, viola!, they have a paper. Academic plagiarism standards have not kept up with the realities of this technology; I have had students tell me that instructors limit them to using a certain number of web sources in a paper. Rather than deal with the complexities, many instructors are simply ignoring the issue.[4] To get at the ethical issues involved with plagiarism in a digital age, technical communication teachers must embrace and understand that this new technology encourages students toward what Howard (1999) called "patchwriting"—writing that is truly collaborative, in this case because it involves sharing material from the wide world of the Internet. With a background of Napster and peer-to-peer file sharing (some

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[4]So, what many students do is read the article on the website (nytimes.com) but then cite it as if they read the hard copy (*New York Times*).

would call "stealing"), it is critical for technical communication teachers and students to understand what it means to write in this environment.

ETHICS IN RESEARCH

Also worthy of its own chapter, if not its own collection, are the issues of ethics when conducting research via the Internet. I have written about this elsewhere and am currently involved in two federally funded studies that involve administering psychological surveys over the Internet. Here, issues of speed, reach, anonymity, and interactivity come head-to-head with concerns about the protection of human subjects and research data. For example, how does one administer a survey, anonymously, over the Internet and on the one hand protect the subject's identity, but on the other hand ensure validity by making sure the same person does not take the survey more than once? How can a researcher be sure that in the wired world, where speed reading is common, research subjects actually read or understand a consent form, a privacy statement, or any other similar document? Should researchers, or working technical communicators for that matter, "lurk" in online forums to learn more about customers but without revealing that they are lurking? The field of Internet studies continues to address this question; in addition, university human subjects review boards are becoming increasingly familiar with research that uses the Internet (either as a medium of delivery or as a site for studying interactions).

ALTERNATIVE MODELS FOR ETHICS AND TECHNICAL COMMUNICATION

So, how do the working technical communicator, the technical communication instructor, and the technical communication student address the ethical issues raised by writing and communication in our Internet age? For teachers, it might be useful to consider the advice of Sullivan (1994), who noted that while the teaching of technical communication does involve imparting a skill set, it also "places ethical and political responsibility upon us," by teaching what is needed for the job market but also including actual case studies (local, if possible) that address social and ethical issues (pp. 231–232). This approach requires instructors to stay ahead of the technology curve; the Space Shuttle Challenger case is not as relevant to today's students as are, for example, the recent legal battles over Napster and other file-sharing technologies. In addition, the idea of "service learning," including real work with real people in real situations, can bring students out of the bubble of the classroom and into actual settings where social and ethical questions are very real on a daily basis.

However, the classroom is a great place to start. In most of my technical communication classes, I include a section on copyright and intellectual property, noting that even when one's use of material might be legal, it may still present an ethical dilemma to use the material without permission from the author. Professor Sam Dragga's class, at http://english.ttu.edu/dragga/5377-270.html, is a good example of an entire class, for technical communication students, on this topic.

For the technical communication student, it is important to consider one's own ethical stance in relation to what is being taught in the classroom. And, students often have a greater understanding of the new technologies and the issues they raise. Students should not be shy about bringing these issues to the attention of their instructors.

For the working technical communicator, everyday workplace situations can present ethical choices, usually subtle but sometimes quite overt. As I tell my students, ethical decisions usually come down to your own instincts and moral code, not to some set of classical philosophical references or even to any case studies you may have encountered as a student. Whether to blow the whistle in the case, let's say, of a faulty medical device that you are documenting may become a very real choice between your job and your values. The Internet can be empowering in that it can allow you to disseminate this information anonymously and bring it to the public's attention. But, especially on today's post-911 Internet, an identity can be traced, so ultimately an ethical choice will live with the individual who makes it.

INTERESTING WEBSITES

You may want to consult the following sites for more information:

The Center for the Study of Ethics in the Professions cites the STC Code of Ethics
http://www.iit.edu/departments/csep/PublicWWW/codes/coe/Society_for Technical_Communication_Ethical_Guidelines.html

STC SIG on usability, page on ethics
http://www.stcsig.org/usability/topics/ethics.html

Reviews of books about plagiarism
http://aw.colostate.edu/reviews/howard_2001.htm
http://www.natcom.org/roc/one-two/Vol2Num2/EkstrandPagiarism.pdf
http://www.humboldt.edu/~cs53/patchwriting.html

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Parsing Codes: Intellectual Property, Technical Communication, and the World Wide Web

John Logie
University of Minnesota

Ever since the advent of the Internet and the World Wide Web, technical communicators have found themselves working in spaces where intellectual property questions are not peripheral, but central. Documents that might have once been understood as "in-house" are now subject to easy reproduction and distribution on scales unimaginable in print contexts. Because electronic storage and retrieval of documents is both speedy and cost-effective, documents function not as isolated end products but as participants in an expanding, interlinked corpus. A document hewing too closely to an online model will likely be exposed, and today's hastily borrowed piece of copyrighted clip art could well prompt tomorrow's lawsuit. Technical communication, in taking to the Web, has finally, inevitably, collided with copyright and intellectual property law. And this collision obliges technical communicators to become familiar with the laws that increasingly intersect with and impinge on their work.

The study of intellectual property laws might seem, at first blush, to fall outside the bounds of day-to-day technical communication, but this research offers considerable rewards to technical communicators who choose to pursue it. Studying intellectual property law offers not only a sense of the United States' evolving treatment of creative works, but also a sharpened understanding of the development of communicative technologies, and of the ways these developments informed American culture. Creators of web and multimedia documents who approach their work with a sense of this history and of how their practices intersect with national and international approaches to intellectual policy will be at a considerable advantage as we move into increasingly networked, interconnected spaces.

Unfortunately for those wishing to pursue a clear understanding of current intellectual property policy, U.S. copyright laws have proven increasingly unstable. Until 1976, an average of 50 years passed between major revisions to American copyright law. And the history of these major revisions reveals Congress taking reasonably tentative approaches to expansion of the scope and duration of copyright. Typically, the by-products of new communication technologies were added to the list of protected works only after they had become firmly established within the cultural landscape. And copyright terms were originally short, and decisively delimited.

In the 21st century, web-focused technical communicators face a dramatically different landscape, in which virtually everything is copyrightable (and copyrighted), and in which copyright terms stretch almost indefinitely into the future. Copyright laws are changing with unprecedented speed, with major shifts in the law occurring, on average, every 5 years. If recent legislative history is any indication, then technical communication in the new millennium will increasingly become a discipline in which it is difficult to act as a "passive consumer" of intellectual property. In particular, web-directed project development will routinely be interrupted by intellectual property questions, such as whether a given image is in the public domain, whether a particular font is available for commercial use, or whether a particular interface design is too close to a competitor's. Technical communicators will need to be able to address these questions as consumers and stewards of others' intellectual property, and as creators of their own intellectual property.

Whereas a comprehensive understanding of the whole of copyright law would require years of study, and "regular maintenance," teachers of web-directed technical communication must secure an understanding of at least the broad outlines of the history of copyright law, and the degree to which these laws are driven by shifts in technology, in order to make informed choices for themselves and for their students. In the current climate, technical communicators need a general understanding of copyright law simply to avoid legal entanglements. But this knowledge also offers opportunities for technical communicators to contribute more than they have in the past to the ongoing debates surrounding intellectual property policies. Technical communicators, in particular, stand to benefit from intellectual property policies that better reflect the realities of crafting documents for electronic environments. Thus, technical communication teachers have a special obligation to encourage students to engage with, examine, and critique the policies that will intersect with and impinge on their professional work. The following summary of the major shifts in U.S. copyright law, with a particular focus on the role communicative technologies played in these shifts, offers a number of potential starting points for research and discussion.

A BRIEF HISTORY OF U.S. COPYRIGHT LAW

Part I: The "Stable Years" (1790–1978)

The history of U.S. copyright law is marked by legislators' increasing responsiveness to the rise of novel communicative technologies. Although new technologies have opened up rich possibilities for technical communicators, these same technologies have provided the impetus for increasingly restrictive intellectual property laws. Those seeking a more open environment for creators and consumers of copyrighted materials will do well to contrast the past quarter century's rapid shifts in policy with the relatively stable and relatively narrow laws that served the United States well for the bulk of the country's first two centuries. At its inception, American intellectual property law had a very narrow scope. Article I, Section 8 of the Constitution states that Congress shall have the power "to promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries." In keeping with this clause, the first Congress enacted the Copyright Act of 1790, which established a 14-year base term of copyright protection for only "books, maps, and charts" with an opportunity for a 14-year renewal term, for a total of 28 years of coverage. A similar act establishing patent rights for inventors' discoveries mandated a parallel 14-year term, but with no opportunity for renewal.

The 28-year maximum term for copyright held until 1831, when the first major revision to the act extended the length of the base term to 28 years, for a potential total of 42 years of protection (if copyright holders took advantage of the opportunity for the 14-year renewal term). By this time, minor amendments had also extended the scope of coverage to engravings, etchings, and prints. The 1831 general revision added "music" to this list, but this protection was directed at printed sheet music, the only "recorded music" then available. Minor amendments in 1856 and 1865 added dramatic compositions and photographs, respectively. These amendments represent the point at which American copyright first extended beyond the printed page.

The second major revision, in 1870, incorporated two major changes. Paintings, drawings, and statues were added to the list of protected works, and rights to derivative works, including dramatizations and translations, were secured for copyright holders. This latter provision was, in essence, a dramatic expansion of the scope of copyright. Until that time, as obvious as it may sound, copyright only addressed copies. The law's scope was essentially limited to print reproductions of extant works. The 1870 revision of the Copyright Act extended coverage to works in which existing content was repurposed, re-used, and sometimes re-envisioned. This provision was at the heart of the recent court battle over Alice Randall's novel *The Wind Done Gone*, in which the Margaret Mitchell estate argued that Randall's unauthorized use of characters and scenes from *Gone with the Wind* constituted a derivative work, and thus, an infringement of Mitchell's 1936 copyright for her novel. Randall's attorneys successfully argued that her work made parodic use of Mitchell's characters and that, as parody, her work did not violate the Mitchell estate's copyright, but this victory was achieved only after a lower court ruling that effectively blocked publication of Randall's novel for months.

This brings up one of the gaps between technical communication practices and copyright law. In technical communication contexts, it is difficult to imagine works that are not, in some way, derivative. Technical communication occurs incrementally, with documents building on one another. And technical communicators rarely make the kinds of proprietary claims that copyright laws are designed to enforce. Johnson (1997) critiqued the stereotypical image of technical communicators as "knowledgeless purveyors of other people's bidding," but there is a germ of truth in this stereotype (p. 361). Although far from "knowledgeless," technical communicators often overtly depend on others' words and ideas, whereas the "Author" at the center of copyright law establishes a proprietary claim because the Author's work is understood as an independent, original act of creation. Thus, since 1870, American copyright law has functioned in ways that could serve to disrupt the networks of collaboration and exchange that are fundamental to technical communication.

The third major revision to American copyright law, in 1909, extended the renewal term from 14 to 28 years, thereby creating a potential maximum term of 56 years. In addition to expanding the duration of copyright, this revision speaks to Congress' increasing attention to the need for policies adequate to the challenges prompted by the advent of then-novel communicative media. In 1897, Congress passed a law criminalizing infringing uses of dramatic and musical compositions if the infringement was "willful and for profit." But, because such infringements were classified as misdemeanors, the most significant penalties for infringement were by-products of civil actions brought by copyright holders against infringing parties. The invention of the phonograph and motion pictures in the late 1800s dramatically changed the cultural landscape. Performances (or, at least, the *records* of performances) were, for the first time, detached from their performers. Performances were transformed from ephemeral events, consigned to memory after their completion, to consumer goods, mechanically reproduced and marketed to the masses.

The consequences of this transformation were not immediately apparent to legislators or the courts. In one memorable 1908 Supreme Court case, *White-Smith Co. vs. Apollo Co.*, the Court wrongly determined that the mass produced piano rolls that enabled "player" pianos were "performances" rather than copies. Twenty years after Edison's invention of the phonograph, the Court was unable to properly distinguish between a performance and a recording, chiefly because the technology enabling recordings was too new to apprehend with real clarity. A century later, we appear to be in a nearly parallel position with respect to the computer technologies that drive the Internet and the World Wide Web. In such times, the voices of early adopters of new communicative technologies become especially valuable. But technical communicators, despite their long history with these technologies, have yet to establish a strong presence in the policy debates surrounding shifts in copyright law.

Consumer-directed computer technologies were, for the most part, not yet available at the time of the fourth major revision to American copyright law in 1976. The technologies prompting this revision, photocopying, cable television, audiotape recorders, and videotape recorders, now seem unremarkable, but at the time, copyright holders expressed fears that these technologies would seriously impinge on their ability to market and sell their wares. In response to these concerns, the 1976 revision expansively characterizes its subject matter as "original works of authorship fixed in any tangible medium of expression, *now known or later developed*, from which they can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device" (17 U.S. Code, sec. 102, *emphasis added*). The following list, enumerating the *"now known"* media subject to copyright protection illustrates the degree to which the 1976 revision constituted a wholesale expansion of copyright:

1) literary works;
2) musical works, including any accompanying words;
3) dramatic works, including any accompanying music;
4) pantomimes and choreographic works;
5) pictorial, graphic, and sculptural works;
6) motion pictures and other audiovisual works;
7) sound recordings; and
8) architectural works. (17 U.S. Code, sec. 102, 1976)

The 1976 revision makes almost any expression that has achieved "fixity" via recording in a "tangible medium of expression" copyrightable.

Though the 1976 revision's expansion of the *scope* of copyright was extensive, the revision's expansion of the *duration* constituted the most dramatic shift in the history of American copyright law. The revision replaced the fixed-year base term and fixed-year renewal term with a new, floating standard, "life of the author plus fifty years." And the consequences of this standard for copyright consumers have been demonstrably dire. Since the revision, copyright consumers have had to struggle to determine whether works are protected or in the public domain. Thus, the 1976 revision firmly established all "fixed" works in any medium as subject to copyright while simultaneously complicating the process of determining whether a given work's copyright term has expired. Because of this revision, technical communicators who routinely create derivative works must now either assume significant risk or devote an inordinate amount of time to the permissions process whenever their works are something other than wholly original.

Prior to the 1976 revision (which took effect January 1, 1978), determining whether a particular work was protected by copyright was a simple matter. A 1962 amendment had extended renewal terms resulting in a maximum possible copyright term of 70 years. Thus, a person who wanted a rough estimate of whether a particular work was protected could simply locate the copyright notice on the work, add 70 years to that date, and thereby establish the last possible year of potential copyright protection for that work. The 1976 revision added an additional 5 years to the renewal terms and also eliminated the notice and registration requirements, which, between 1909 and 1978, ensured that works without significant economic value moved expeditiously into the public domain. Many potential copyright holders neither registered nor renewed their works, in the latter case limiting their potential protection to 28 years, and in the former, eliminating it altogether. Although researching whether proper registration and renewal for a given work had occurred could be a daunting task, all works fell into one of three categories—unregistered and thus unprotected, registered but unrenewed, and registered and renewed—and definitive identification of the date a work would enter the public domain was possible in each case. For works created since January 1, 1978, the math is considerably more complex. The "life plus . . ." standard obliges a potential copyright user to either locate the copyright holder and attempt to negotiate a reasonable price for that use, or, in the alternative, to ghoulishly await the demise of a work's creator and then start a creator-specific copyright clock ticking.

The 1976 revision also codified "work for hire," a special category of intellectual property of particular interest to technical communicators. A "work for hire" is defined in the revision as "a work prepared by an employee within the scope of his or her employment," and the copyright for such works is presumed to belong to the employer or hiring body. Thus, unless technical communicators negotiate special terms, most technical communication is, by definition, work for hire. To avoid the obvious difficulties inherent in applying the "life plus" term to functionally authorless works for hire, Congress established a separate term for works for hire of 75 years from first publication, or 100 years from creation, whichever expires first. The renewal term for works with existing copyrights was also expanded, from 28 years to 47 years, raising the potential duration of coverage from 48 to 75 years. On the whole, the 1976 revision constitutes the most dramatic expansion of copyright protection in this nation's history, extending both the scope and duration of copyright.

Whereas the bulk of the 1976 revision functions as a tremendous boon to copyright holders, the codification of the fair use exception represents Congress' passing acknowledgment of the importance of the public domain, and of open access to copyrighted work under certain special circumstances. The revision specifies "criticism, comment, news reporting, teaching (including multiple copies for classroom use), scholarship, [and] research" as special activities wherein users may be entitled to make substantial use of copyrighted materials without making payment or securing permission (17 U.S. Code, sec. 107, 1976). The revision outlines a 4-point test to be applied by courts on a case-by-case basis to determine whether a given use is a "fair use or infringement." Courts are directed to consider

> (1) the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes;
>
> (2) the nature of the copyrighted work;
>
> (3) the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and
>
> (4) the effect of the use upon the potential market for or value of the copyrighted work. (17 U.S. Code, sec. 107, 1976)

Under the 1976 fair use doctrine, a classroom instructor at a public university distributing multiple copies of an excerpt from a copyrighted article drawn from a disciplinary journal, (thereby potentially enhancing the value of the work) would almost certainly be judged to be making a fair use of the copyrighted material. But, if that same instructor compiles a coursepack of whole articles for a third party to sell to students, then courts might well find (as a federal district court found in *Basic Books v. Kinko's, 1991*) that such a compilation is too commercial, incorporates too much (i.e., all) of the copyrighted works, and will likely have a negative effect on the values of the copyrighted works, and thus, is an infringing use of those articles. Whereas technical communicators in academe might successfully rely on the fair use doctrine as a shield against charges of infringement, professional technical communicators should expect no such protection. The most recent edition of *Reporting Technical Information* (2002) asserted that "when you are writing a student report that you do not intend to publish, you need not concern yourself with [copyright] laws" (p. 675). Of course, much hinges on the understanding of "publish," because copyrighted material posted to a classroom's web space or an electronic mailing list (and thus, to the wired world at large) might well prompt action from a copyright holder.

Prior to 1978, copyright was predominantly print-directed, and copyright terms were easy to calculate. The arrival of consumer-oriented electronic recording technologies, especially audio and video taping systems, prompted a wholesale transformation of copyright law. This transformation has, by and large, expanded copyright holders' rights at the expense of the public domain and consumers' ability to make reasonable uses of copyrighted materials. And this trend has accelerated in response to the digital revolution of the late 20th century.

Part II: Copyright Gets Wired (1978–Present)

As the previous section makes clear, during U.S. copyright law's first two centuries, major revisions in the law occurred, on average, once every 50 years. By contrast, in the last quarter century, there have been five major amendments to U.S.

copyright law. The first was the United States' signing of the Berne Convention in 1988. This yoked the United States to a largely European understanding of intellectual property grounded in the concept of "moral rights" or "natural" rights. In contrast to the U.S. approach, in which the public grants a monopoly right to creators for a limited time, moral rights are grounded in a belief that an artist's act of creation carries with it certain natural rights that typically include exercising a measure of control over a given work even after it has been sold. These rights are potentially unlimited, as illustrated by a recent French case in which Victor Hugo's descendants attempted to have a sequel to *Les Miserables* pulled from bookstores. Whereas the U.S. Congress continues to reject stateside legislation enumerating moral rights for creators (such measures are introduced in almost every congressional session), the signing of the Berne Convention effectively extends moral rights to U.S. creators. Hollywood studios routinely ask screenwriters, for example, to sign away moral rights as part of the sale of their scripts. Technical communicators might well encounter similar provisions in their contracts, and should recognize that when they sign away moral rights, they are surrendering rights that are potentially every bit as valuable as a copyright.

The next three major changes—the No Electronic Theft (NET) Act, the Digital Millennium Copyright Act, and the Sonny Bono Copyright Extension Act—all transpired within the 105th congressional session (1997–1998), and all three respond to the increasing popularity of the Internet and the World Wide Web.

Although the 1976 revision addressed itself to "any tangible medium of expression now known or later developed," and was clearly meant to extend to advances in new media as they were developed, the revision's inability to precisely address the particular challenges of intellectual property in computer-based spaces proved worrisome as personal computers become increasingly affordable and popular. In 1992, responding to tremendous pressure from the major players in the software industry, the 102nd Congress established specific criminal penalties for violating computer software copyrights. But whereas this minor extension of copyright law effectively recognized software as a new kind of "work" subject to protection, it did not address the kinds of issues raised by the linking of computers to one another in networked systems, largely because these networks were typically found in high-powered research facilities or, more commonly, on college campuses. The cumbersome early interfaces for file transfers and database searches made it difficult to envision such uses ever becoming widespread. But the menu-driven networked computing environment was dramatically transformed by the development of the core protocols for the World Wide Web by Tim Berners-Lee at the European High-Energy Particle Physics Lab (CERN) in 1991, and the software application that first made the Web available to the public, the Mosaic graphical browser, developed by the University of Illinois-based National Center for Supercomputing Applications (NCSA) in 1993.

Prior to the release of Mosaic, hypertext links were typically confined to particular programs on a particular computer. Mosaic married hypertext to the already established, but graphically limited, Internet, thereby enabling the replacement of crude text-based menu systems with image-rich point-and-click interfaces. Within the brief history of the Internet, the Mosaic browser stands out as the most dramatic "killer app" yet invented, but the trustees of the University of Illinois, in keeping with the mission of a public, land grant university, made the browser available to the bulk of the world at no cost. The Illinois trustees' nuanced approach to copyrighting Mosaic is reflective of the time prior to the "dot-commodification" of the World Wide Web. A 1995 web page entitled "Procedures for Licensing NCSA Mosaic" documents the trustee's use of copyright not as a means of enforcing the price of access, but as a device to ensure the noncommercial circulation of the software. The page begins with an expansive assertion of copyright: "NCSA Mosaic(tm) software is under copyright by The Board of Trustees of the University of Illinois (UI) The UI restricts its use and distribution. The software is not public domain, freeware or shareware" (NCSA, 1995, ¶ 1).

But this aggressive statement of apparent ownership is quickly countered by language that effectively deeds Mosaic to the general public, so long as the public agrees not to sell the software:

> Mosaic . . . can be downloaded from the NCSA ftp server . . . at no cost by any individual for personal use and for use at an academic institution. Mosaic is also available for internal business use, meaning a company may use Mosaic inside the company, and only inside the company, without charge. However licensing is required if NCSA Mosaic is distributed outside of the company, a company product requires the use of Mosaic, or the company facilitates the installation of the software in any way. (NCSA, 1995, ¶ 3)

The Illinois trustees almost certainly recognized the tremendous potential value of Mosaic. Shortly after Mosaic's release, many members of the Mosaic development team left the NCSA to develop a for-profit clone of Mosaic, Netscape Navigator. And Navigator, in turn, prompted Microsoft to accelerate development of its own browser, Internet Explorer, so that it could be incorporated into Windows95. The World Wide Web in the immediate wake of Mosaic's release was an identifiably "dot-edu" space, in which collegial exchanges of information were commonplace. In 1995, the opening of Amazon.com kicked off a wave of commercial exploitation of web space, and "dot-com" addresses came to dominate the Web, supplanting the ".edus" and ".orgs." In this newly commercialized landscape, webbed information was repositioned as a commodity, but the 1976 copyright revision did not offer the captains of web commerce enough security.

Whereas the academically focused "dot-edu" era passed without significant congressional intervention, the rise of the "dot-com" era prompted almost immediate congressional action. And the tentativeness with which Congress once approached expansion of the scope and duration of copyright in response to novel communicative media was supplanted by Congress' aggressive attempts to police the evolving Web. Taken together, the three major pieces of copyright legislation passed by the 105th Congress point to a profound shift in the politics of intellectual property within the American cultural landscape. Because technical communicators routinely work at or near the technological cutting edge, and because technical communicators often are among the earliest adopters of new communication technologies, their work often transpires in spaces where intellectual property laws are uncertain and unsettled. In the past, those who ventured into copyright's gray areas could depend on a "cease and desist" letter from a copyright holder's attorney to roughly define the law's boundaries. But, in the past decade, the penalties have grown exponentially, and technical communicators now face a creative landscape loaded with legal landmines. These new laws each have the potential to impinge on conventional practices within the academy and the workplace.

The Congressional Response to the Rise of the World Wide Web: A Drama in Four Acts (So Far . . .)

Act I: The No Electronic Theft Act of 1997. This act established felony criminal penalties for the circulation of copyrighted software, or "phonorecords," via the Internet and the World Wide Web, in direct response to the *LaMacchia* case, in which an MIT student made downloadable copies of copyrighted software available via an Internet-based bulletin board without charging for the software (although he encouraged others to submit software to the board). Because LaMacchia did not seek or secure a direct financial profit form his activities, his activities were beyond the scope of existing copyright laws. Whereas LaMacchia was effectively enabling piracy via the Internet, the NET Act was properly criticized as a blunderbuss approach to addressing the legal loophole that enabled LaMacchia's activities. In the Senate debates prior to the bill's passage, Senator Orrin Hatch asked, pointedly, "What of the educator who feels that his or her action is a fair use of the copyrighted work?" (Hatch, 1997, ¶ 3). Hatch, whose grasp of new media far outstrips that of most of his Senate colleagues, also observed that the act potentially criminalized simply loading a program into one's computer:

> I am concerned about the interplay between criminal liability for "reproduction" in the bill and the commonly held view that the loading of a computer program into random access memory [RAM] is a reproduction for purposes of the Copyright Act. . . . Many shrink-wrap licenses limit the purchaser to making only a single backup copy of his or her software. Thus, under a literal reading of the bill, the ordinary purchaser of computer software who loaded the software enough times in the 180-day period to reach the more-than-$1,000 threshold may be a criminal. This is, of course, not the intent of the bill. Clearly, this kind of copying was not intended to be criminalized. (Hatch, 1997, ¶ 8)

Although acknowledging the bill's flaws, Hatch ultimately supported it "because of the severity of the potential losses to copyright owners from widespread LaMacchia-like behaviour and the little time remaining in this session." Hatch's ultimate focus on the needs of copyright holders underscores the NET Act's telling break from the inherent public orientation of the Constitution's copyright clause.

The NET Act provides for a prison sentence of "not more than three years" for a first-time violation. Up until this point, violations of copyright were primarily civil matters. The economic harm caused by offenses against intellectual property rights prompted financial penalties on a case-by-case basis. An infringing user's punishment, arguably, bore a direct relation to the financial harm the infringing user had inflicted. Now, the penalties include hard time.

Act II: The Digital Millennium Copyright Act of 1998. The Digital Millennium Copyright Act (DMCA) was, in effect, a bundle of five conjoined bills that (among other consequences) made the United States a signatory to the World Intellectual Property Organization treaty and extended copyright protection to, of all things, *vessel hulls*, thereby effectively blurring the distinction between copyright and patent law. The core of the DMCA is its prohibition of devices and techniques designed or used to circumvent copy protection systems. Under the DMCA, circumvention of copyright protection systems as rudimentary as simple password protection can result in severe penalties. A first offense deemed willful and "for purposes of commercial advantage or private financial gain" can result in a fine of up to $500,000 and up to 5 years in prison. A second offense doubles the potential penalties to a million dollars and a decade behind bars. Elements of the DMCA were clearly intended to protect reasonable uses of copyrighted material, including reverse engineering and research on encryption techniques, but other potential applications of the DMCA were criticized as overly broad by watchdog groups and consumer advocates. Time has borne out their concerns.

In July 2001, Russian programmer Dmitry Sklyarov was arrested at a Las Vegas computer security conference for his purported violation of the DMCA. His "crime" was the creation and display of a program that allowed users of the proprietary Adobe eBook software to override the software's copyright protection system in order to open eBook files in Adobe's relatively insecure PDF document format. An article on the Sklyarov arrest properly pointed out that Sklyarov's program can be understood as restoring typical user's rights to purchasers of eBooks: "The eBook Reader application restricts the way a purchaser of an eBook can use the file—including restricting reselling, copying, backing up and printing—rights traditionally given to the purchaser of items like books under the First Sale and Fair Use legal doctrines" (IDG, 2001). Thus, whereas eBook purchasers may technically possess the aforementioned rights, they had no means of exercising these rights without Sklyarov's software, and Adobe faced no penalties for distributing software that impeded these uses. Whereas Sklyarov's software constituted a questionable intervention into the relations between Adobe and the purchasers of the eBooks, it hardly seems the kind of activity that ought to trigger a stay in a federal penitentiary, especially when civil remedies for copyright infringements often result in substantial awards to the plaintiffs. Sklyarov spent 3 weeks behind bars before a public outcry prompted his release on bail, and a subsequent negotiated agreement allowed him to return to Russia provided that he checks in with the U.S. Justice Department on a monthly basis. This case clearly announces the level of risk that arises when software engineers attempt to revise or extend existing software for purposes that might not be endorsed by the maker of the original software. Because technical communicators often work closely with software engineers in development teams, they need to be aware of when their work might cross the lines drawn by the DMCA.

The DMCA also contains a provision that effectively directs Internet Service Providers wishing to avoid participation in the act's penalties to expeditiously remove material from circulation whenever a claim of copyright infringement is received. This removal is supposed to occur prior to any court's determination that an infringement has, in fact, occurred, and despite the ISP's role as a conduit, rather than a creator of information. An ISP owner who fails to respond to calls to remove a potentially infringing website could conceivably end up rooming in Dmitry Sklyarov's old cell.

With the NET Act and the DMCA in place, university lawyers and corporate counsel have promoted increasingly restrictive interpretations of fair use, in hopes of minimizing potential exposure to the severe criminal penalties established by these laws. Although such approaches are prudent, given the current legal climate, they also tend to stifle the inventive, inquisitive culture that has historically characterized the discipline of technical communication.

Act III: The Sonny Bono Copyright Extension Act of 1998. Gurak (1997) argued that "current trends in copyright legislation are very much out of balance, favoring the author or creator (increasingly, a large edutainment company—not an individual or scholarly publisher) over the public" (p. 330). At the time, Gurak and I had been working, along with members of the Conference on College Composition and Communication's Intellectual Property Caucus (CCCC–IP) to lobby Congress in order to defeat a bill then known as the Copyright Term Extension Act of 1997. The bill called for an addition of 20 years to the then-extant copyright terms, changing the term of protection for authored works from the already expansive life-plus-50-years to life-plus-70, and changing the terms for works for hire, pseudonymous works, and anonymous works from 75 or 100 years (dependent on whether or not the work had been published) to 95 and 120 years.

The Intellectual Property Caucus was among dozens of organizations lobbying in opposition to the passage of the extension, but these lobbying efforts paled before those of the major copyright holders, especially the Disney Corporation. When Representative Sonny Bono, one of the bill's strongest advocates, died in a skiing accident, the bill was renamed in his honor and its passage took on an aura of inevitability. On October 7, 1998, the bill was passed by the House of Representatives on a voice vote, and signed into law by President Clinton 3 weeks later.

Gurak accurately described the pre-Bono Act landscape as one in which the public domain was already shrinking. But the Bono Act effectively rendered the public domain comatose. Prior to the Bono Act, each New Year's Day heralded the ultimate entry of a given year's works into certain public domain status. For example, on January 1, 1998, works published in 1922, including, for example, T. S. Eliot's *The Waste Land*, and Virginia Woolf's *Jacob's Room*, entered the public domain. Or, perhaps it is more accurate to say that they returned to the public domain, given that American copyright laws stem from public grants of monopoly protection for limited times. But, when the Bono Act took effect on January 1, 1999, works from 1923, which would have entered the public domain, received a 20-year extension, and will not achieve public domain status until at least 2019. Of course, this calculation assumes that no further extensions will become law.

Shortly after the passage of the Bono Act, Eric Eldred sued the U.S. Attorney General (then Janet Reno, but the case eventually became known as *Eldred vs. Ashcroft*) on the grounds that the act was unconstitutional. Eldred, a web-based purveyor of public domain texts, argued that the law unfairly benefited copyright holders at the expense of the public's interest in access to older texts. In January 2003, the justices ruled, by a 7–2 margin, that Congress has the right to make, effectively, any laws it wishes regarding the copyright term, no matter how bad those laws might be. The justices' suggestion that the Bono Act was indeed bad law came as cold comfort to those who had hoped the case would function as a check on the ongoing erosion of fair use and the public domain.

Whereas the World Wide Web possesses tremendous potential as a digital repository for cultural artifacts precisely because of its ability to store and transmit these artifacts at high speeds, the Bono Act effectively halts the digitization and free circulation of material created from 1923 to the present. The Bono Act functionally precludes the storage and transmission of the whole of American cinema, limiting the archive to those films that pre-date the first Academy Awards ceremony by 5 years or more. Most American recordings postdating the career of Enrico Caruso (who died at the height of his career in 1921) are covered under the Bono Act's term extension, and are unavailable for use except through licenses (at whatever price the copyright holders dictate) or under the narrow exemptions outlined under the fair use provisions. The electronic archives developed for fields with long disciplinary histories are impressive despite the 1922 cutoff, but electronic archives supporting the work of technical communicators are comparatively rare. Technical communication, as a field, falls almost wholly within the copyright "window" created by the Bono Act. Fifty-year-old technical documents typically have no appreciable economic value, and no sensible institution would set out to create a web-based archive of exemplary 1950s-era technical communication documents, given the likelihood that copyright claims would surface and expose the archivists to costly litigation. As a practical matter, technical communicators will likely be unable to freely circulate and research documents falling within the expansive Bono protection windows, to say nothing of their loss of opportunities for reasonable and ethical appropriation and re-purposing of extant materials for multimedia and web development.

These three major pieces of copyright legislation passed by the 105th Congress each materially alter the bargain between copyright holders and consumers. In the wake of these three major revisions, technical communicators will do well to tread carefully in cyberspace. Early visitors to cyberspace often described it as a kind of frontier, often comparing it to the formerly "wide open spaces" of the American West, but these three laws make it clear that the cyber-frontier has been settled, and settled with a decided bias toward copyright holders. More often than not, the copyright holders are not the creators of the works at issue. In those industries where work-for-hire is not standard, publishers, studios, and record companies have all developed standard contractual practices that efficiently separate copyrights from creators. The music industry, in particular, has an especially poor track record with respect to artists' compensation. And this, in part, accounts for students' (and some consumers') apparent lack of concern over violating record company copyrights when using Napster and similar file-sharing programs. But this overt rebellion is at odds with technical communication's disciplinary commitment to high ethical standards.

Act IV: The TEACH Act. In November 2002, President George W. Bush signed the Technology, Education, and Copyright Harmonization Act, or "TEACH Act," into law as part of an omnibus appropriations bill for the Justice Department. At first blush, the TEACH Act would appear to represent the 107th Congress' attempt to correct the 105th Congress' overreaching intellectual property policies. The TEACH Act, introduced by Senator Orrin Hatch, announced itself as intending: "To amend chapter 1 of title 17, United States Code, relating to the exemption of certain performances or displays for educational uses from copyright infringement provisions, to provide that the making of copies or phonorecords of such performances or displays is not an infringement under certain circumstances, and for other purposes" (21st Century, 2002). Whereas the act as passed does not reference distance education, its legislative history suggests that this was the sponsors' focus. A June 2001 congressional summary of the bill that became the TEACH Act states that the proposed act "revises Federal copyright law to extend the exemption from infringement liability for instructional broadcasting to digital distance learning or distance education" (S. 487—Bill Summary and Status for the 107th Congress).

But, over the course of the bill's progress through Congress, all references to distance education were stricken, and the remaining text might be understood to leave distance educators and educational institutions more generally with even fewer rights than they had before the passage of the TEACH Act. The 1976 revision's fair use exemptions had been generally understood to offer broad leeway to instructors wishing to make use of copyrighted materials within their classrooms. The only marked limit on this use materialized in cases of coursepacks without copyright clearance, and what the copyright industries described as "abuse" of library reserves. But the advent of distance education programs, requiring the transmission of copyrighted material over broadcast and Internet-based media, prompted Congress to revisit this question.

The writers of the University of Texas System's "Copyright Crash Course"—one of the best available Web-based resources for cultivating an understanding of copyright laws and policies—have properly pointed out the excessive demands placed on distance educators who would seek to honor the TEACH Act's conditions for class use of copyrighted materials:

> the statute specifies a formidable list of circumstances under which the permitted uses may be made
>
> 1. *The performance or display must be:*
>   a. A regular part of systematic mediated instructional activity;
>   b. Made by, at the direction of, or under the supervision of the instructor;
>   c. Directly related and of material assistance to the teaching content; and
>   d. For and technologically limited to students enrolled in the class.
> 2. *The institution must:*
>   a. Have policies and provide information about, and give notice that the materials used may be protected by, copyright;
>   b. Apply technological measures that reasonably prevent recipients from retaining the works beyond the class session and further distributing them; and
>   c. Not interfere with technological measures taken by copyright owners that prevent retention and distribution. (The TEACH Act Finally Becomes Law)

In order to navigate the various requirements, the TEACH Act attached to the notion of fair use within distance education environments, the "Crash Course" authors offer a 17-point checklist of statements that would clearly establish a fair use under the terms of the act. As the authors wryly observed, "This statute's complexity provides a new context within which to think about fair use: compared to the many conditions and limits contained in Section 110(2), the four factor fair use test seems, well, simple and elegant" (The TEACH Act Finally Becomes Law). This complicated array of conditions will likely grow even more cumbersome when paired with the typical caution of university lawyers and administrators, who tend to err on the side of caution. It is likely that the presence of the TEACH Act will prompt the crafting of pedagogical policies designed to preclude any possible litigation, regardless of the setting. Thus, although the act was pitched as a projection of well-established fair use rights into distance education settings, it may ultimately have the perverse effect of functionally narrowing the range of activities understood as fair use.

These four acts, spanning less than half a decade, are already transforming the legal and academic landscapes. And they are but the first wave of an increasing tide of legislative, legal, and procedural activity that will reverberate throughout campuses and technical communication workplaces. To the extent that the World Wide Web remains a core workspace within these settings, it too will be transformed by the steps taken in U.S. courtrooms and classrooms.

AND SO, ARMED WITH THIS KNOWLEDGE . . .

I am by no means the first scholar to suggest that technical communicators' use of the World Wide Web and electronic media obliges them to pursue an increasingly active engagement with the intellectual property policies governing their expressive practices. Gurak (1997) called for technical communicators to "take actions professionally, in the classroom, and in our academic journals that will at a minimum raise awareness about [copyright and public domain] issues and, if conducted with vigor, help maintain the important balance between rights of copyright holders and rights of the public" (p. 337). My implicit argument in my admittedly partisan accounts of the shifts in copyright law since 1997 is that the balance Gurak identified no longer exists. Because the current imbalance strongly favors copyright holders at the potential expense of both consumers and creators of intellectual property, Gurak's call to action now has even greater urgency.

Writing at roughly the same time as Gurak, Porter (1997) argued that because hypertext operates in electronically enabled rhetorical environments markedly different from the print spaces that prompted and shaped copyright for most of its history, hypertext might reasonably be considered functionally exempt from at least some print-directed policies. Porter was careful to stress that ethical obligations with respect to attribution do not evaporate in electronic contexts, but he suggested that ethical technical communicators might, at times, choose to break copyright laws. Porter wrote: "The technical cyberwriter must recognize the role and value of the law, and its power—but not let writing decisions be completely determined by it" (p. 61). Whereas I wholeheartedly endorse Porter's assessment, and would argue that the largely depressing arc of recent legislation has intensified the need for principled resistance to the worst aspects of copyright law, my concern is that if these acts of resistance occur without clear and public statements of the nature of the actions taken and the rationales for these actions, then these acts of civil disobedience will be dismissed as episodes of mere carelessness or worse, theft.

The Napster case is instructive on this point. Most, but not all, Napster users were employing the file-sharing service to secure copies of copyrighted materials that were readily available at retail outlets, over the objections of the copyright holders. But a small percentage of Napster users were simply sharing materials that creators had placed on the service for general distribution, or works whose circulation via Napster was endorsed by the creators. Others used the service to track down obscure and out-of-print materials that, although sometimes copyrighted, were no longer commercially available at any price. And some users were researchers or classroom teachers seeking material for review, comment, and criticism. These users were arguably entitled to share these files via Napster, but their failure to argue for the integration of their uses into the portrait of the typical Napster user sent the service hurtling toward a crippling defeat in the courts. And this defeat occurred despite the fact that the Supreme Court had ruled, in a 1976 case establishing the legality of Sony's Betamax brand videotape recorders, that whereas many VCR users would probably use their recorders to infringe copyrights, the VCR also enabled noninfringing activities like time shifting of television programs. Both the VCR and Napster's file-sharing technology have significant noninfringing applications. The VCR has since become a staple in American homes, but Napster is now a fading memory. These disparate results are largely attributable to Congress' continuing shift toward protecting the interests of copyright holders. Even so, had Napster's noninfringing users functioned as true "friends of the court" by publicly and powerfully articulating the circumstances of and rationales for their uses, the result might have been different. Their arguments might have repositioned Napster's software as a tool that was being deployed for both ethical and unethical uses, and focused the legal debate on the question of how best to circumscribe and punish unethical uses, rather than the question of whether the tool itself ought to continue to exist.

Not every technical communicator has the time, space, or energy needed to become an activist on intellectual property issues, but most every technical communicator possesses the rhetorical skill to argue for principled approaches to the treatment of protected materials, and to carefully articulate the rationales for particular intellectual property decisions, *even when these approaches and rationales appear to be at odds with current intellectual property laws.* Articulating these positions is not without risk, and the consequences of allowing intellectual property laws to swell indefinitely are, potentially, every bit as risky. As Herrington (2001) argued in *Controlling Voices*, beyond a certain threshold intellectual property debates stop being about the ownership of cultural artifacts and start being about freedom of speech.

Because technical communicators often are among the first adopters of new communicative technologies, they have a special obligation to model ethical policies and procedures for the use of those technologies. At minimum, technical communicators have an obligation to actively engage with intellectual property issues when they intersect with their work, and technical communicators must take steps to articulate the ethical bases for their use of copyrighted materials whenever those uses are at odds with current copyright laws. Whenever possible, these arguments should be made as public as possible. The World Wide Web constitutes an outstanding vehicle for posting and circulating these arguments.

For this to happen, teachers of technical communication will need to commit to a significant expansion of their treatment of intellectual property issues within their classrooms. As a first step, technical communication instructors should ask students to review their home institution's intellectual property policies and contrast them with the policies the instructor and students have encountered in their workplaces or while interning. This small step will almost certainly throw the distinctions between academic and professional approaches to intellectual property into sharp relief. In my experience, most students are troubled by these disjunctions, and even more troubled by the laws as written. Historicizing these laws helps to explain how we got to the current circumstance, and students of technical communication are especially well positioned to understand the complicated relation between communicative technologies and copyright laws.

Technical communicators have, for the past century, been expected to adapt their messages to new technologies. Those charged with explaining the newest and latest technologies typically understand the possibilities and potential conflicts raised by these technologies well before the courts or Congress is able to address them. With the advent of the Internet and the World Wide Web, the opportunities are manifold for communicative practices to move several steps ahead of the law or institutional policy. Technical communicators have not always found effective ways to give voice to their understandings and concerns, as they move into the spaces created by new communicative technologies.

My closing challenge to web-based technical communicators is a simple one: Whenever current copyright laws—or worse, restrictive local interpretations of these laws—prevent the completion or circulation of works that make ethical and fair uses of source materials, the spaces that would have housed those works should instead be filled with pointed arguments announcing the absence of the work and arguing why the work should be made available. For example, an HTML "frame" that might have housed a copyright-protected illustration within a web page could instead house an announcement that the illustration will not be available until its copyright term expires. A web bibliography could feature both active links to "live" web-based documents, and "protest links" for dated print resources that might, but for copyright, be electronically archived. Such "protest links" would point to a page, which explains that the work in question is unavailable on the Web due to the expansive scope and duration of U.S. copyright law.

For too long, overly lengthy copyright terms and overly cautious intellectual property policies have prompted silences, absences, and refocusing of energies toward less legally precipitous territories. Technical communicators, with their profound connections to both the creation and consumption of intellectual property, with their commitment to developing and understanding new communicative technologies, and with their facility *as communicators*, should offer leadership in our impending national debates. By offering the web-reading public graphic illustrations of the losses to what was once understood to be the public's domain, technical communicators will, I hope, help to productively shift current discussions on intellectual property issues back toward policies that offer communicators and their audiences reasonable access and use rights to copyrighted materials in the real and the virtual spaces of the 21st century.

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11

The Chilling of Digital Information: Technical Communicators as Public Advocates

James E. Porter
Michigan State University

What can be said, what must not be said? What information can be shared, what information must be hidden? What information can be freely distributed, what information must be paid for? Technical communicators have always had to be cognizant and respectful of laws and regulations regarding the distribution of information (e.g., laws and ethics regarding copyright and the fair use of others' writing). However, what happens when repressive laws and regulations conflict with the technical communicator's rhetorical obligation to serve the needs of readers and the public at large?

In the realm of web writing (with its potential for broad public distribution of information) and in the post-911 political climate, the technical communicator faces new and increasing constraints, regulations, and prohibitions regarding the use and distribution of information. Certain forms of technical information that were once web accessible are not now being shared with the public because of emerging legislation and policy. A recent U.S. Department of Justice policy gives federal agencies license to withhold information that might be deemed vital to "safeguarding our national security" (Ashcroft, 2001). Developing certain kinds of software programs could violate the anti-circumvention measures of the Digital Millennium Copyright Act (DMCA). Simple declarative statements, such as "Hamburgers are high in fat," could violate food libel laws in certain states (Hatherill, 1999).[1] Borrowing digital images and text or even hyperlinking to an

[1] In 2000, Oprah Winfrey was sued by a group of Texas cattle ranchers, under a Texas food disparagement law, for saying on her show that "it [mad cow disease] has just stopped me cold from eating another burger" (Wall, 2000; see also Collins & McMasters, 1998).

online article could constitute digital copyright infringement. We live in an era where the seemingly virtuous act of informing the public could be illegal, dangerous, even traitorous.

In this chapter, I examine the "chilling effects" that discourage, constrain, and prevent technical communicators from distributing certain kinds of information. "Chilling effects" refers to laws, policies, and practices—by government, by business, or by other organizations and institutions—that impede the flow of information (chiefly, but not exclusively, digital information); constrain the rights of free speech under the First Amendment; and/or discourage the exercise of fair use under the U.S. Copyright Act. Sometimes a chilling effect is a direct form of censorship by law or policy. However, in many cases, information is not legally or officially proscribed; rather, the chilling effect indirectly discourages the use of information (e.g., through threats, implied or actual, or through impediments to access).[2]

A bevy of recent laws and judicial decisions, agency policies, emerging legislation, and in-progress litigation (or threats of litigation) now restricts (or has the potential to restrict) the availability of information on the Internet. In the first two parts of this chapter, I focus on two different types of "information chill" that could affect the work of technical communicators[3]:

1. The restrictions on technical information in the aftermath of the September 11th terrorist attacks on the World Trade Center in New York and on the Pentagon in Washington, DC.

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[2]Several public advocacy organizations maintain websites tracking the suppression of digital information. The Electronic Frontier Foundation maintains a page on the "Chilling Effects of Anti-Terrorism," which lists websites that have been shut down or have removed information since 911. The Chilling Effects Clearinghouse, a collaborative effort between legal interest groups and the Electronic Frontier Foundation, publicizes unwarranted legal attacks on legitimate website activity. The Clearinghouse aims to protect free speech and fair use of digital information from chilling efforts by government and business. OMB Watch (Office of Management and Budget), which oversees federal agencies like the EPA and the Federal Energy Regulatory Commission (FERC), has been tracking the removal of information from public (chiefly government) websites. OMB Watch has noted, interestingly, that a government can effectively change policy indirectly through suppression of information and the control of document distribution. The Federation of American Scientists sponsored a "Project on Government Secrecy" that tracks how legislation and government policy impact scientific information. The project supports an online newsletter (*Secrecy News*) that provides updated information on secrecy and intelligence policies. Other related groups include the Center for Democracy and Technology (2002), the Freedom of Information Center, and the International Center for Information Ethics. These web-based watchdog organizations publicize constraints on information that the mainstream media (i.e., television, newspapers) do not typically cover.

[3]First and foremost, the information chill is a *digital* chill: These two developments most immediately impact the flow of digital information on the World Wide Web. However, these restrictions and prohibitions, designed primarily to address the "problem" of easy and widespread information distribution on the World Wide Web, are having a secondary fallout effect on print.

2. The challenges to the fair use of digital information on the World Wide Web, particularly challenges to the practice of hyperlinking without permission.

The third part of the chapter turns from the public realm to consider our ethical principles as technical communicators and as technical communication teachers. I argue that we need to revise our professional codes of ethics to address the political nature of our professional practice. Our current ethical codes are too narrowly cautious, favoring the interests of business and industry; the advocacy of clients and employers; and the immediate needs of readers and users. In the current political climate and in the realm of web writing, it is increasingly important for technical communicators and their teachers to address their role vis-à-vis the public interest. For technical communication teachers, this means teaching in a more politically astute way, critically examining current laws and policies regarding digital information, and focusing on technical communication as public advocacy.[4]

THE POST-911 INFORMATION CHILL

After the September 11th attacks, the federal government and numerous states enacted policies restricting access to technical information (McKinley, 2002; OMB Watch, 2002, February 1; Scheeres, 2001). These policies were enacted through agency fiat, not through any act of legislation or voting procedure. "Vast amounts of information have been removed from government websites," according to an OMB Watch report on the status of government information (2002, February 19). According to Lagasse (2002), the removed information included "locations of nuclear power plants, chemical hazard risk management plans, terrain and pipeline maps, and reports related to hazardous chemicals, aerospace research, and environmental issues." The U.S. Geological Survey asked libraries to destroy a widely distributed CD-ROM listing characteristics of water reservoirs—and libraries complied, without public discussion. Historical maps were removed from public archives (Federation of American Scientists, 2002). A number of states, including Florida and New York, have not only removed public information from websites and libraries, but are also passing (or drafting) legislation that allows states to "ex-

[4]As this paragraph makes clear, this discussion moves us into a realm we might call "the politics of information," where rhetorical decisions overlap with ethics and politics. Technical communicators (and technical communication researchers) frequently discuss *ethical* issues in communication. However, we have been less vocal about *political* issues. My discussion in this chapter resides at the intersection between rhetoric, ethics, and politics (Porter, 1998), focusing especially on the political dimensions of information access and distribution.

empt documents or records from public disclosure" (Associated Press, 2001). Although some of this material no doubt deserves to be classified, Lagasse (2002) made the important point that "much of this information had originally been placed on the Internet to help civilians to protect themselves against the effects of attacks and accidents."

On October 12, 2001, U.S. Attorney General John Ashcroft sent a memo to federal agencies that, according to Rosen (2002), urged them "to resist most Freedom of Information Act (FOIA) requests made by American citizens" (see Grimaldi, 2002). Ashcroft's memo actually begins by affirming the value of the Freedom of Information Act: "It is only through a well-informed citizenry that the leaders of our nation remain accountable to the governed and the American people can be assured that neither fraud nor government waste is concealed" (Ashcroft, 2001). However, the memo represents a shift from the policy established in 1993 by the previous U.S. Attorney General, Janet Reno, who encouraged federal agencies to cooperate with FOIA requests (Lagasse, 2002). Ashcroft's position represents a shift in presumption: from the position that wide access to information is a public right to a position favoring privacy and secrecy. Ashcroft assured federal agencies that if they "decide to withhold records, in whole or in part, you can be assured that the Department of Justice will defend your decisions." This shift corresponds to a view of information that favors control and constraint (vs. wide access to information). It is a view that ultimately places trust in governmental representatives as opposed to the public (see Table 11.1).

To a great extent, the change in information policy is occasioned by the September 11th terrorist attack, and by the legitimate recognition that terrorists pose a security threat to the health and safety of American citizens. No one is arguing that detailed blueprints of nuclear power plants should be widely accessible on the Web. However, other forms of information that serve the public good (and are unlikely to aid terrorists) have also been suppressed. For instance, the Federal Aviation Administration has stopped publishing online information about security breaches at airports, an action that prevents the public from having valuable information about airport safety (Graham, 2002). Would making this information widely accessible assist terrorists—or help deter them? Making the public aware of security breaches can actually make airports safer, because public awareness can bring public pressure to bear on airports to close gaps in their security systems.[5] Access to information is not only vital to "the democratic dialogue," according to McMasters (2001, December 12), but wide distribution of information is also the best safeguard of civil liberties and "a crucial element of our safety." An informed

[5]Another example of information chilling: According to OMB Watch (2001), there have been calls to restrict public distribution of environmental Risk Management Plans (RMPs), documents mandated by the Clean Air Act for the purpose of keeping the public informed about environmental risks in their regions and communities. The assumption behind Risk Management Plans is that an informed citizenry contributes to the effort to reduce risks from chemical and other types of environmental accidents. Is our society safer with or without this information?

TABLE 11.1
Political Views Toward Information Access and Ownership

	Presumption in Favor of:	
	Control and Constraint	*Open Access and Distribution*
View of public access to information	Information is potentially dangerous (e.g., to the safety of the state and its citizens) if it falls into the wrong hands. Better to withhold information from the public than to allow information to leak into wrong hands. Trust elected representatives to know what is best.	Information is required for knowledge and awareness; it is essential to the functioning of a democracy and the effective functioning of the state. Citizens need full access to information in order to understand and decide what must be done. Citizens need information to oversee and influence decisions of elected representatives.
View of property and ownership of information	Information is private property. The incentive for production requires strict ownership and control. Without guarantees of ownership and control, there is little or no motivation for production. (aka, "CopyRight")	Information is a shared resource. New works and inventions can only be created if there is wide access to ideas in a robust public domain. A robust public domain is not only in the public interest, but it serves economic interests as well, creating demand for new products. (aka, "CopyLeft")
View of what World Wide Web should be	Shopping mall, advertising billboard, Internet television → public can view and then buy, but interaction is controlled and negative or potentially dangerous information is suppressed	Library, community forum → information is widely accessible to the public; Web is forum for discussion, disagreement, critique, parody
View of authority (who should decide)	Experts, elected representatives	Informed citizenry

public might in fact be the best possible defense against terrorism (McMasters, 2001, December 7). Perhaps the most troubling aspect of these information policy decisions is that they are being made without significant public input or discussion (McMasters, 2002).

Foucault (1971) recognized the force of chilling effects on discursive practices: "In every society the production of discourse is at once controlled, selected, organized, and redistributed according to a certain number of procedures, whose role is to avert is powers and its dangers, to cope with chance events, to evade its ponderous, awesome materiality" (p. 216). Foucault, a critical theorist whose work has profound implications for rhetoric theory, is seldom cited by technical communicators. But his rhetoric theory in "Discourse on Language" addresses an important aspect of the rhetorical situation, an aspect that traditional rhetoric theories never sufficiently treated because their image of the rhetor was a white male in a position of authority, freely capable of speaking (whether or not that was actually true). Foucault took up the issue of passive censorship, or chilling effects—that is, the ways in which rhetors are constrained from speaking. In asking questions about who is allowed to speak, and what are the rules or conditions for speaking, Foucault brought to rhetoric a set of questions that we should adopt in developing an ethics and politics of access and distribution for digital information.

Foucault's contribution to rhetoric is to recognize the force of exclusion, the way that power operates in discursive situations to voice some speakers and to silence others. Foucault is talking about discourse prohibition—what must not be said. And he did not mean this simply in the sense of blatant state censorship. Rather, he looked at prohibition as a subtle set of forces that operates to authorize speaking/writing opportunities. By pulling information off their websites, government agencies are not necessarily censoring that information in a strict sense; however, they are making information less accessible, controlling and discouraging its distribution, making it less publicly visible.[6] The presumption has shifted, at least in the federal government, from a policy of freedom of information to a policy of information secrecy or to what Graham (2002) called "the new culture of secrecy."[7]

We may be entering a political era—maybe temporary, maybe not—where technical communicators will have to address the problem of exclusion and the chilling of information. (At the time of this writing, in January 2003, the United States stands on the brink of war with Iraq, an event likely to lead to greater restrictions on information flow.) What will be our position, our rhetorical philosophy, regarding technical information? Do we generally hold to a position where wide public distribution of information is seen as desirable?—a position that assumes some trust in the public as the best safeguard of democratic ideals. Or, do we hold to a position where wide public distribution of information is viewed as a potential threat to

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[6]In some cases, federal agencies are removing information and not making it accessible to the public. In other cases, information is being removed from websites, but is still available via other mechanisms. For example, under the Freedom of Information Act, an interested party could write and request a particular federal agency report. If the party is willing to use conventional print mechanisms for securing that report (print request, print copying, U.S. mail) and is willing to pay a nominal fee for copying, then the agency might send the report. In this latter case, the information is not being censored per se, but the information is more difficult to obtain. It is not easily or quickly accessible. It is more difficult to distribute and publicize, and the person requesting the information must identify themselves and their location. In this case, the agency is not denying information, but is simply being resistant about providing it. This behavior constitutes a "chilling effect," but it is not, strictly speaking, censorship.

[7]The federal government is also placing restrictions and limitations on the work of academic scientists, whose federally funded projects are coming under increasing government control and restriction (see Borrego, 2002; Greenberg, 2002; Monastersky, 2002).

safety and security? This view assumes that experts or political representatives are the best judges of whether or not information is "safe." Whatever our political views about information policy, we need to recognize that technical communicators reside at the center of this issue, and should be speaking to it.

THE DIGITAL COPYRIGHT CHILL

Another sort of information chill has been in progress since about 1996, when corporations first began to recognize the commercial potential of the Web and first started to worry about protecting their intellectual property online. What is now happening on the World Wide Web is that corporations and organizations are using the threat of a lawsuit—as presented in the infamous cease-and-desist letter—to chill information distribution on the Web. Corporations are objecting to websites that parody their products, services, or image; to websites that "deeplink" without permission; and to search engines that either deeplink or, as in the case of the Church of Scientology, that link to material critical of the company or organization.[8]

Corporations and organizations are using the 1998 Digital Millennium Copyright Act (DMCA) as leverage, in effect using DMCA to circumvent the fair use provision of copyright law, which allows use without permission in certain contexts and for certain purposes (Vaidhyanathan, 2002). In particular, they are using the DMCA to block criticism (e.g., parody sites) and the common web practice of linking without permission to websites. For example, the Church of Scientology used the threat of a lawsuit under DMCA "to persuade Google [the search engine] to block links to several sites that included criticism of Scientology" (Vaidhyanathan, 2002, August 2, p. B7; see also Hiler, 2002). Perhaps Google should not have been coerced by the mere nuisance of a lawsuit. But the accusation of copyright infringement is often sufficient discouragement for publishers and web developers who do not have the financial resources, the time, or the will to fight a costly lawsuit to determine if in fact infringement actually took place. It is so much easier and cheaper to remove offending links.

Notice that Google did not actually produce the web pages critical of the Church of Scientology. Merely by providing links to those pages as an Internet service provider, Google is potentially liable for infringement under the DMCA, because DMCA holds Internet service providers accountable for digital information on or passing through their sites.[9] In cases like this, companies are using

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[8]The Chilling Effects Clearinghouse was developed precisely to address the chilling effect of such threats by publicly exposing them on the Web. The Clearinghouse publishes and provides legal analysis of cease-and-desist letters.

[9]Section 512 of the DMCA, the so-called safe harbor provision, is supposed to protect Internet service providers from infringement claims. But to exercise this provision requires some effort by the provider (e.g., assigning an agent to deal with claims).

copyright law as a means to chill criticism, even in situations where the law seems to support a particular web-authoring practice.[10]

Technical communicators do not typically produce parody websites, at least not as part of their employment. However, technical communicators do develop websites with links to useful information, and they do develop comparative information that could reflect negatively on a given company's products or services (e.g., software reviews). Increasingly, companies are objecting to deeplinks to their technical information. On September 13, 2002, the lawyers for the Fanuc Corporation sent a cease-and-desist letter to Google, invoking the DMCA to demand that Google remove links to technical information on Fanuc's site (pages having to do with the operation and control of machine tools) (Chilling Effects Clearinghouse, 2002). Increasingly, companies are including in the legal notices on their websites prohibitions against linking without permission. (The "Don't Link to Us!" website maintains an archive of such policies.) Increasingly, companies want to control how users enter their sites—that is, they want them to enter via the home page. The General Electric website identifies as its fundamental linking policy that "all links to the Site must be approved in writing" (http://www.ge.com/ge/gl_terms.htm#external)—unless the links meet certain criteria that GE deems acceptable (e.g., the link points to the GE home page, "not to deeper pages"). The American Cancer Society has a similar restriction against deeplinking on its site, http://www.cancer.org/eprise/main/docroot/SU/content/SU_2_Linking_Information. (For further discussion of deeplinking, see Isenberg, 2000; McCullagh, 2002.)

Notice that these examples are not about *borrowing* copyrighted information (i.e., using texts, images, and copyrighted material under the fair use provision of copyright law). The restrictions are about merely *linking* to existing information, in effect, using the Web in the way in which it was designed.

What do these chilling effects mean, practically speaking, for the technical writer? It means that if I am creating a website for a healthcare clinic, then I cannot link, without permission, to the American Cancer Society page listing cancer statistics in the United States or to the page that lists useful advice about cancer prevention and early detection. Or at least that is what it means if I choose to heed their web policy, which is not necessarily a justifiable or legally sanctioned policy.

What in fact does the law allow or prevent in regard to linking? As is so often the case, the law is murky on this question. A few years ago, the law seemed relatively clear; commentators were using the decision in the *Ticketmaster v. Ticket.com* case as a precedent to support the position in favor of hyperlinking. As one legal analyst summarized: "Hyperlinking does not itself involve a violation of the

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[10]According to Samuelson (2001), the Digital Millennium Copyright Act (DMCA) is also constraining the work of "scientists who study encryption or computer security or otherwise reverse engineer technical measures, who make tools enabling them to do this work, and who report the results of their research" (p. 2028).

Copyright Act (whatever it may do for other claims) since no copying is involved. The customer is automatically transferred to the particular genuine web page of the original author. There is no deception in what is happening. This is analogous to using a library's card index to get reference to particular items, albeit faster and more efficiently" (Gigalaw.com, 2000).

However, in 2002, the legal issue became murkier. In the *Kelly v. Arriba* case (also known as the *Ditto.com* case), the 9th U.S. District Court of Appeals found that the Ditto.com website was guilty of copyright infringement through linking: "Specifically, the court found the 'in-line' linking style used by Ditto.com—in which a new browser window displayed each Kelly photo within the standard Ditto.com layout, and contained the same advertising as the Ditto.com site—was illegal because it could fool viewers into thinking they were still on the Ditto.com site" (Dizikes, 2002). This case complicates the legal question about hyperlinking: When is it legal, when is it potentially infringing?

The basic defining component of web authoring is the hyperlink—the connection a writer creates between one page and another. Until recently, external hyperlinking (i.e., linking to other sites) was considered rhetorically analogous to a citation: An external link was simply a connecting device that allowed the user to move easily and efficiently to related information on a topic. Kubiszyn (2002) articulated this basic premise regarding the Web and hyperlinking: "Linkers argue that deep linking is simply in line with the free nature of the web, that anyone who creates a web page in effect grants the entire cyber community an implied license to link to that page. Besides, the linkers contend, they are actually doing the linked sites a favor by driving users to the linked site."

There are numerous arguments in favor of viewing hyperlinking as simply a form of online citation. In its publication guidelines, the Association for Computing Machinery (1995) viewed the hyperlink as analogous to a bibliographic citation in the print world—a reference or pointer to an existing piece of information—and writers certainly do not ask permission to cite sources of information. Rhetorically, the link functions like a citation. However, technologically a link works differently, because the linking involves the actual downloading (or copying) of the information being linked to. From the technological standpoint, linking involves an act of copying—and this is why copyright law is being applied to the practice. The insight of the ACM is letting the policy be guided by "the rhetorical rather than merely the technical nature of cyberwriting" (Porter, 1997, p. 58). The ACM citation principle is based on an academic, gift-exchange model that encourages cross-referencing and acknowledges the interconnectedness and collaborative nature of knowledge. But that philosophy runs counter to an ownership model that attempts to establish clear, unambiguous proprietorship.

However, despite these rhetorical arguments in favor of hyperlinking, commercial interests are taking a different view and trying to legislate that view through coercive measures. What has resulted is that the practice of hyperlinking on the World Wide Web, a practice fundamental to how the Web works, is becoming increasingly restricted. Corporations and organizations are using the DMCA to control the use and distribution of information, insisting that web developers need permission to deeplink to information on those sites. They attempt to police web authoring practice through their own web permission policies and, when necessary, through cease-and-desist letters that threaten lawsuits for copyright infringement. Although the Digital Millennium Copyright Act was developed in order to update U.S. copyright law for the digital realm, and particularly to promote the development of digital information on the World Wide Web, the way the law is actually being used threatens to change the very nature of the Web: to change it from an open forum where information is widely and freely accessible, to a marketplace where information is protected, restricted, bought, sold, and strictly controlled.

Where do technical communicators stand on this issue? Under what circumstances do we need to ask permission to borrow copyrighted text and images or, moreover, to link to existing information on the Web? The STC Code of Ethics says that "before using another person's work, we obtain permission"—but, aside from being an impractical policy, *always* asking permission does not serve the public interest, if such activity undermines fair use. *Always* asking permission undermines fair use by legitimizing corporate claims that they can control hyperlinking to their web material.

The linking issue is only the tip of a much larger copyright iceberg that has to do with the "corporate takeover of electronic writing" (Porter, 1999; see also Lessig, 2001; Samuelson, 1996, 1998; Schiller, 1989). From a corporate standpoint, electronic information poses a problem. It is too easy to access, copy, distribute, and publish. As information becomes the new number one product of the U.S. economy, copyright law becomes a crucial scene for playing out the question of ownership of that product. Baudrillard (1983) predicted this: Signs are the new product. Corporations have to establish tighter controls over signification in order to profit from it (or so is thought to be the case). To put this in traditional literary terms, there must be an original text with an assigned author. It is vital for corporations to be able to insist that the creation is "original," they are the assigned author, and they have absolute authority over the rights of access and distribution. The fluid nature of Internet interactions and distributions (i.e., the ease and speed with which intellectual property can be downloaded, copied, and widely distributed by individuals) causes a problem for a model relying on control over intellectual property.

The dynamic of the World Wide Web is being changed—designed and determined by public policy discussions, by legislative and judicial action, and by corporate behavior in which technical communicators are, so far, not much involved. That is too bad. These developments may well result in public policies and eventually laws that will constrain and legislate our professional practice as technical communicators. For that reason, we need to exercise our political responsibility and promote clear and reasonable policies regarding public access to information.

POLITICS, THE PUBLIC INTEREST, AND OUR PROFESSIONAL CODES AND PRACTICES

Where does the field of technical communication stand on the issue of information access and public interest? The Society for Technical Communication (STC) Code of Ethics (1998) proclaimed that as technical communicators, "We serve the business interests of our clients and employers as long as they are consistent with the public good." That is an oddly indirect phrasing—weasel-ly, one might say. It seems to suggest that the public good trumps "the business interests of our clients and employers," but it also evades saying that directly and boldly. The Association for Teachers of Technical Writing (ATTW) Code (2002) listed the responsibilities and obligations that technical writing teachers have to a number of parties—to students, to the public, to the technical communication profession, to the academy, and to nonacademic employers and contractors—but the code does not order those priorities.

Professional codes are not intended to provide specific advice or to handle tricky circumstantial matters; they are intended, rather, to establish general core principles and priorities. However, this said, codes do need to identify a clear set of primary values and priorities, and neither the STC code nor the ATTW code does that very well. The STC code, in particular, fudges around between the technical communicator's obligations to the client or employer and obligations to the public. The STC code insists that "we seek to promote the public good in our activities." But the primary emphasis of the entire code is on representing the interests of "employers and clients." Although I would certainly agree that technical communicators should work on behalf of their employers and clients, what about the public interest? What does the technical communicator do when the interests of employers and clients run counter to public interests? In the practical, daily world of technical communication work, we are likely to find ourselves caught between principles and stuck in ethical gray areas. I expect that such conflicts occur frequently, not rarely, even in the more traditional, print-oriented work of technical communicators. In the realm of writing for the World Wide Web, such conflicts are likely to be frequent.

At what point of conflict and in what situations does the public interest trump the obligation to employers and clients? No code can answer specific questions about particular circumstances. However, a professional code of ethics should signal its priorities more clearly. By contrast, the Code of Ethics of Engineers clearly and unambiguously identifies the public interest as its first priority: "Engineers shall hold paramount the safety, health and welfare of the public in the performance of their professional duties" (American Society of Mechanical Engineers, 2002). The codes governing the professional practices of journalists and librarians also have a much stronger and clearer sense of public advocacy than does either the STC or ATTW code.

The first priority of a professional area of practice, such as technical communication, should be the interests of the public at large. As a professional, the technical communicator should be, first and foremast, a public advocate. We need to be clear about this priority, or else our practice runs the risk of falling prey to an ideology of technical expediency, which Katz (1992) warned about.

Katz (1992) opened with a memo written to a supervisor in 1942 by a technical writer named "Just." The memo precisely and directly described technical "innovations" that Just recommended for vans to enable them to better transport their cargo. (Just recommended that the vans' load space be reduced, the lighting be better protected, and a sealed drain be added to the vehicles to make cleaning easier.) As Katz explained, "By any formal criteria in technical communication, [the memo] is an almost perfect document" (p. 256); it is clear and concise, well organized, and logically argued. The problem with the memo is not the information it contains, but rather the information it hides: The "cargo" for these vans is Jews being transported to Nazi death camps. Just's supervisor, the audience for the memo, is a Nazi SS-Obersturmbannführer named Walter Rauff.

Katz's example is an extreme one, but it makes an important ethical point about technical communication. It is ethically questionable, even dangerous, for the technical communicator to assume that information is neutral: That is, that technical information can be presented, reported, distributed, or hidden, without regard for the impact of that information on people. But which people? Just was, I suppose, "serving the business interests" of his employers (the SS); and he is a "good technical writer" from a narrowly formalist perspective. But, serving that narrow interest (in this case, an egregiously unethical interest) is precisely the problem. The technical communicator must serve not only the immediate needs of clients and employers, but also the immediate and long-term needs ("the good") of a larger audience: call it the community, the society, the public at large. There is a larger moral consideration involved in technical communication than simply the needs of the client. (The STC code does acknowledge this point, albeit reluctantly.) In circumstances when the public good is in direct and obvious conflict with the interests of clients and employers, the technical communicator must be enjoined to put the public good first. Other professional groups (e.g., journalists, librarians, engineers) are clear about this priority. Why not technical communicators?

The field of technical communication needs a clear statement of ethical priorities, which can admit that, at times, priorities conflict. We especially need such a statement in a political and economic climate, such as now, that favors censorship, secrecy, expert control, and private ownership of information. Technical information is being chilled, and technical communicators need to be prepared to negotiate the conflicts and difficult decisions that will inevitably arise in such a climate.

REWRITING THE CODE

Let me conclude by suggesting two revisions to the STC Code of Ethics. The first would realign our fundamental ethical priorities:

> As technical communicators, we serve the business interests of our clients and employers; the needs of the readers and users of the documents we produce; and the immediate and long-term public good. In situations where the interests and needs of these various parties conflict, we serve the interests of the public first and foremost.

Such a statement clarifies the ethical priorities that should guide technical communication practice. It would strengthen the status of technical communicators as professionals (i.e., people who serve society at large) rather than as hired hands of industry. The statement also articulates a rhetorical obligation to serve readers and audiences who are different from clients and employers.

The second revision addresses the political aspect of our professional practice, establishing technical communicators as advocates of the public right-to-know. In this respect, the revision takes a clear political stand on behalf of information access. Note, this stance does not say that all information must be made public to everyone at all times. Rather, the statement expresses an ethical priority: that is, the presumption lies in favor of broad information access, except in those cases where information distribution clearly would cause harm:

> As technical communicators, we work to promote wide public access to information. We strive to make useful information widely and readily accessible to our readers and to the public—while at the same time being sensitive to privacy issues, protective of the proprietary interests of our clients and employers, and alert to the ways in which technical information can be used for harmful and destructive purposes. We are informed and actively involved participants in public discussions about information policy, information access, and copyright.

Notice that the statement expresses the need for technical communicators to be *advocates for public access* to information. Let me say that again, with a twist: Technical communicators need to be *public advocates for access* to information. In the age of digital rhetoric and writing, the work of technical writers will increasingly be affected by political, legal, and legislative battles that impact the production and distribution of digital texts and images. We need to be involved in those discussions. That's a political role our field is not accustomed to embracing. However, it is a basic type of technical writing literacy: It is both an "ethical literacy" and a "critical literacy"—to cite two of the six literacy categories that Cook (2002) identified as important for technical communication.

The second revision calls indirectly on technical communication teachers to address the ethics and politics of information access and distribution. In a sense, the ATTW code already asks teachers to do that; it urges technical writing teachers to foster in their students "a sense of ethical responsibility to themselves, stakeholders, and the public" (ATTW, 2002). This revision of the STC Code would invite teachers to take that injunction more seriously—to make the ethical and political questions of information access and distribution central to technical communication instruction.

What does it mean to practice technical communication as a "public advocate"? First, it means that we need to understand the larger and long-term public implications of specific writing practices. We need to develop a better sense of the politics and economics of our writing practices. We must develop political positions on important questions pertaining to information access and ownership (see Table 11.1). Where do technical communicators stand on questions of information distribution? On questions of digital copyright? On the question of the nature of the Web? Technical communicators have to speak out on these issues, and the field as a whole needs to determine its ethical and political stance on information policy.

Our ethical codes emphasize following the rules and obeying the client. But, in the realm of web writing, the rules are not yet established; they are now being negotiated and determined. The guidelines we articulate and the ways we practice web writing have the potential to shape nascent guidelines and regulations. I would like to see technical communicators play an active and vocal role in determining those guidelines—and in speaking out in favor of broad public access to information. We have to work to make sure that chilling effects do not prevent us from providing information vital to the health, safety, and security of our clients, our readers, and the public.

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II

ISSUES AND SUGGESTIONS FOR PEDAGOGY IN DEGREE AND SERVICE PROGRAMS

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12

Integrating the Web into Education for Technical Communication Majors: A Process-Oriented Approach

Saul Carliner
Concordia University

In an August 2000 conversation with me, Schriver observed:

> Some things [in technical communication] have stayed the same. One continuing sameness is an interest in writing and editing. People have maintained that from the first time I heard the phrase technical communication.
>
> What has changed is that many people in the field [now] realize that what we do is much larger than writing and editing and that the fields that can help us think about what we're doing are really diverse: cognitive psychology, graphic design, typography, human factors, comprehension, management and planning. I think that more people today have to be a jack of all trades even if they're working in large organizations where there's lots of support.

In fact, practicing technical communicators are often responsible not only for planning and writing information, but also for managing projects, designing and producing documents, and editing peers' work. In some organizations, technical communicators are also responsible for user-centered design, and usability testing. As the work has broadened in scope, so has the challenge of integrating this broader range of responsibilities into everyday practice. Within the academic world, the response has usually been separate courses. That is, each new responsibility usually adds a new course to the curriculum. For example, to address design and production issues, many programs now offer courses in visual communication. To address project management, many programs now offer courses on that topic. And to address user-centered design, many programs now offer courses on usability.

Within the professional community, however, technical communicators and others who produce technical content have addressed this challenge by integrating the additional competencies into the single process for developing technical communication products (such as the LUCID process developed by COGNETICS—www.cognetics.com/lucid/—and processes described by Hackos, 1994, and Barnum & Carliner, 1993).

This concept of process significantly differs from the process-oriented approach to teaching composition that became popular in the early 1980s. The earlier concept of process emerged from research that looked into the way that people compose documents, such as the research performed by Flower (1989). As these researchers explored it, process described the way that people who are not professional communicators prepare functional documents (a term that some people used to define documents with a practical goal). In contrast, "process" to professional communicators is a *pre*scription of a series of activities for publishing communication products that were commissioned as works-for-hire (Gustafson, 1991).

This chapter explores the impact of a process-oriented approach on curriculum design and classroom instruction for majors. Because the process prescribed for the professional technical communicators to write for the Web is significantly more intricate than the process used by nonprofessionals to develop functional documents for internal use, this chapter starts with a background on the process for developing technical communication products. Then, it explores specific issues involved in teaching a process-oriented approach. Last, it suggests implications of this process-oriented approach on the design of curricula for graduate and undergraduate major programs.

BACKGROUND: THE EMERGENCE OF PROCESSES FOR DEVELOPING CONTENT

My interest in the process of developing technical communication products is an organic one, emerging from my work as a practicing professional, enhanced by academic study in the field. I first became aware of the process on starting my first job as a technical writer, 7 weeks after receiving a bachelor's degree in professional communication. The new employee orientation in my department focused solely on the publications process, and I noticed that all management practices in the department were structured around that process: The process dictated schedules, served as a primary measurement metric, and provided a common language with which to talk to other publications departments, support groups, and programming and engineering departments.

My understanding of process deepened when I began developing training courses. The training field is dominated by instructional systems design (ISD), a methodology for developing courses that is taught and followed in industry. I was completing a master's degree in technical communication at that time, and this process did not play the central role in the curriculum or the work that it did in instructional technology, the academic discipline behind instructional systems design. In that field, the process taught in the classroom usually mirrors that used on the job. After I completed my doctorate in instructional technology, the Web was becoming the dominant medium of interest among technical communicators. I noticed that the web designers were advocating a development process that looked much like the instructional design process (such as the one described in Rosenfeld and Morville, 1998), and began to incorporate the process into several of my courses on technical communication.

My growing awareness of process mirrors that of the field of technical communication. The following sections explore how a process for technical communication emerged and how it has taken shape, as well as discuss some unique issues that arise in implementing processes for the development of content to be published on the Web.

Early Processes for Developing Content

One of the first formalized processes for designing and developing content was proposed by the American Institutes for Research (AIR) in the early 1940s. The process was designed to help the U.S. military, which faced the challenge of efficiently developing training on new military technology, minimize the time needed to design, develop, and deliver training so it could introduce the technology into the field as quickly as possible. In response, the AIR proposed the first model of Instructional Systems Design (ISD), which prescribes a series of steps to follow when developing training, The process ensures that the right questions were asked at the right time, and the content is properly described so that it can be most efficiently sequenced, taught, and retained (Deutsch, 1992). Although elaborated on, updated (Gustafson, 1991; Gustafson & Branch, 1997; Reiser, 2001), adapted by corporations for their unique needs (such as IBM's Systems Approach to Education), and occasionally attacked (Gordon & Zemke, 2000), the Instructional Systems Design model remains the core approach to developing content for training courses, even for the Web (Driscoll & Alexander, 2000; Hall, 1997; Horton, 2000). Figure 12.1 shows one popular adaptation of the Instructional Systems Design model.

This systematic process to design and development is not unique to the development of training courses. A similar approach is used to develop software (Pfleeger & McGowan, 1997), hardware products, public relations and marketing communications materials (Saffir & Turrant, 1994), and even social service programs.

Early Processes for Developing Technical Publications

Faced with the daunting task of publishing 50,000-plus page libraries for large mainframe computer systems, and ensuring that all of those pages would be available on the same day, many large corporate technical publications departments

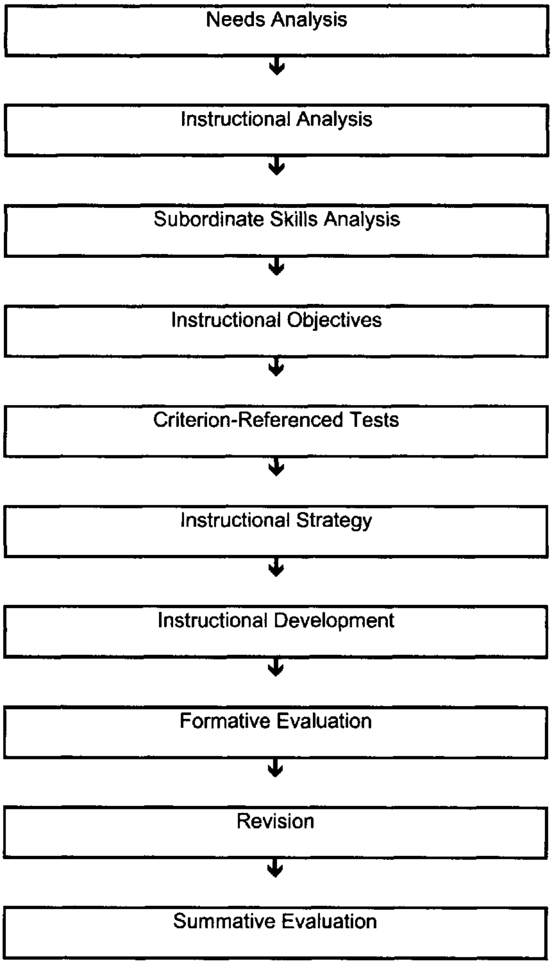

FIG. 12.1. Instructional systems design model (Dick & Carey, 1990).

responded with their own processes in the 1960s and 1970s. For example, one large minicomputer manufacturer developed and documented a 13-milestone process in the late 1970s.

This process was designed for 6- to 12-month development cycles; that is, developing communication products according to this process took 6 to 12 months. The process was also designed for producing "documentation"—that is, communication products whose primary purpose was documenting the functions and features of the system, rather than explaining how to perform tasks with the products. Most users were highly technical and would receive extensive training; the documentation extended that experience. Finally, this process is activity focused.

TABLE 12.1
An Early Corporate Publications Process

Milestones	*Activities*
1 through 4	Planners used these checkpoints for information planning: identifying the topics to be covered in a given communication product, estimating the number of pages and illustrations, and estimating the development schedule and budget.
5 through 12	Writers and editors used these checkpoints to develop and edit drafts: • Odd numbered checkpoints indicated when drafts were due • Even numbered checkpoints indicated when reviews should be completed.
13	Drafts sent to the production department, where another editorial assistants followed a rigid 13-week cycle for producing documents: copyediting, final typesetting (this process was developed before the age of desktop publishing), production, transmittal to the publisher, preparation of plates, printing, and distribution to the warehouse.

That is, it focuses on the tasks performed by the technical communicator during the phase, rather than on the end product of that work. These activity-focused processes bear a strong resemblance to the processes described by the composition research performed at the time.

Limitations of Early Publications Processes

Fundamental shifts in business and product and communication technologies outdated activity-focused processes like this one. A shift from products for the technical elite to products for the average consumer transformed technical communication products from documentation of functions and features to instructional guides that replaced training and, when feasible, technical support (Redish, 1995). To meet shifting consumer demands, product development sped up, shortening development cycles from 6 to 12 or more months down to 3 to 6 months. A combination of reduced labor costs resulting from the rise of desktop publishing and price pressure in the market led to reductions and eliminations of editorial and production staffs. As a result, technical communicators not only wrote their communication products, but also illustrated, edited, and produced them, too. The same cost pressures led the clarion for more accurate cost estimates (Hackos, 1994) and demonstrations of return on the investment in documentation (Mead, 1998). The focus on customers that resulted from the Total Quality Movement of the early 1990s expanded the roles of marketing organizations and customers in product development (Fredrickson, 1990). Increased exposure to liability and, in certain industries, regulation, led to a similarly increased involvement of corporate attorneys and, in some cases, government regulators.

Technology changes that provide publishing flexibility also require a process-oriented approach. New publishing technologies permit *single-sourcing* of content. Single-source content is saved in a single-source file on the computer, but can be published in a variety of formats, including eXtensible Markup Language (XML), HTML (web format), portable data format (PDF), word processor, and desktop publisher. This allows organizations to provide users with content in their preferred format, but requires extensive up-front coordination, only feasible through a well-defined process (Kostur, 1999; Tsai, 2001). Related to single-sourcing are *content objects*; that is, content that can be mixed and matched (much like clothing separates) (Aldrich, 2001). The coordination required to identify the objects, and design them for easy tailoring and reorganizing, also requires extensive up-front coordination that is only feasible through a well-defined process. Related to content objects is the concept of mass-customizing information. That is, by tracking, recording, and interpreting a user's behavior with a Web site, specific content objects can be presented to the user that address the user's anticipated needs. One current example of this is the list of recommended books and CDs that Amazon.com presents to users who have made purchases at its site.

In short, a vastly changed business and technological environment meant that activity-focused processes used by publications departments insufficiently addressed the issues they faced when developing communication products. A new type of process had to emerge.

Hackos (1994) raised the issue of the development process in her book on project management for technical communication. Like many in the pre-Internet software development environment, she drew parallels to the software development process. The processes for developing technical communication products in software development organizations should work in lock-step with those for developing software, and many used similar terminology, such as Alpha Draft (first) and Beta Draft (second) to match terms used in the software development process. Her process focused on the management of the development of the software and is a top-down process: that is, nearly all estimating is done at the beginning of the process.

Foshay noted that top-down estimates were usually 20% off of the actual budgets and schedules. He proposed, instead, a phased approach that was more common in the advertising and nonprofit industries, where design is separately funded and performed and includes estimates for more costly development efforts, which are separately funded projects. He found that planned and actual schedules and budgets for phased projects only varied by 3% (Foshay, 1997). Similarly, pre-web development processes tend to focus on management of the development effort, with minimal direction given to the design effort.

Finally, although a process-orientation to software development is recommended by many experts in the field, many organizations do not follow it. In fact, the Software Engineering Institute at Carnegie Mellon University found that processes fall into one of five categories. The first two categories, in which the process is *laissez-faire* at best, are the most common (Pfleeger & McGowan, 1997). In response, one new software development process, called extreme programming, shuns the structure of formal processes (as per a discussion on the Society for Technical Communication's Management Special Interest Group List, June 2002).

Issues in Developing Processes for Technical Content Delivered on the Web

Because technology lets users write one minute and publish the next, certainly many web development efforts are laissez faire and provide strong pressure for organizations to stay so. However, most professional web development efforts are, in theory, process oriented. Part of this is the influence of early authors, such as Rosenfeld and Morville, whose 1998 *Information Architecture* explored the virtue of process. Part of this has to do with the nature of early web development efforts. Many corporate websites were developed by outside agencies. Many agencies find that following a process and communicating that process to clients helps them better meet clients' needs and better set their expectations. As Robinson (2000), then chief experience officer at Sapient, noted:

> I am not at all of the school of thinking that says that the wonder and the spark of an intuitive solution doesn't matter in this world, or that all design is going to become rational. The best of things always have a huge streak of play in them, and there are always gaps. What project planning, research design, and design planning do, is set up situations so that those problems that need a more intuitive approach are much more clear; they allow people to apply personal experience, intuition and personal points of view to the right kinds of problems. In many ways, I think the discipline that gets brought to these more complex programs can open up a lot of opportunity for people for those things to have a most profound impact.

Many of the first well-publicized web development efforts were focused on e-commerce, but the principles clearly influence technical communicators. Key features of the process that technical communicators have adopted include the following:

- Focused on the needs of sponsors. That is, underlying the entire development effort is an understanding that the primary goal is to achieve a business objective established by the individual or organization that is funding the web development effort. This funder, or sponsor, is the individual who can authorize payment for a project (or stop it) (D. Robinson & J. Robinson, 1989). A sponsor might be internal to the organization (such as a vice-president for development or director of marketing), or external. The sponsor is not the user, and often has goals that are at odds with users.
- Use of up-front analysis. Up-front analysis involves a detailed identification of the audience(s) and purpose(s) of the site, as well as the business and tech-

nical constraints affecting it, to ensure that the website works with the specified technology, and can be developed with the resources available. Up-front design incorporates a variety of techniques recommended by user-centered design, such as use cases (also scenarios of use) (Nurminen & Karppinen, 2000), and archetypes (a type of character description that goes beyond demographics to put faces on the average and outlying users; Cooper, 1999).

- Establishment of observable and measurable objectives. One set of objectives pertains to business performance—that is, how the website contributes to revenue, contains expenses, or helps an organization comply with regulations (Carliner, 1998). Another set of objectives pertains to users' performance, that is, the tasks users should be able to perform, and the acceptable time limit, accuracy, and level of satisfaction.
- Assessment of whether the objectives have been met. That is, the design effort must explain how the sponsor can assess whether the business and content objectives have been achieved, and identify the resources to do so (Carliner, 2000a).
- Specification of the format (genre) of the content. When technical communicators almost exclusively published printed content, most of the work fell into three general genres: the user's guide, reference manual, or report. In contrast, because of a difference in reading patterns online coupled with a difference in the technical capabilities of the medium, the Web has let technical communicators significantly expand their repertoire of communication products to include several additional genres, including how-to articles, wizards, smart forms, guided tours, and context-sensitive help (J. Price & L. Price, 2002).
- Permission for experimentation with alternative designs, through the use of rapid prototyping (Plass & Salisbury, 2002).
- Required adherence to content and technology standards. Standards documents identify the conventions that the development team must follow. Templates, which operate like fill-in-the-blank forms, ensure adherence to coding and layout guidelines. Custom-designed spelling and grammar checkers limit the possibilities for editorial variation. Inherent in the use of templates is the understanding that most technical communicators not only write their own content, but also prepare it for publication (such as those techniques described in Plass & Salisbury's, 2002, process for designing a knowledge management system).
- Documented plans for developing the content. These blueprints—plans—significantly differ from traditional information plans (Rockley, Kostur, & Manning, 2002; Rosenfeld & Morville, 2002). A traditional plan only provides a list of topics to be covered (usually as an outline). A blueprint also describes how the content will be presented, including the number of topics needed and the presentation strategy. These are usually documented on *storyboards* or *wireframes.*

- Appropriate involvement of the full development team, including sponsors and users, by specifying their active involvement at certain phases.
- Designed for phased funding. Although the entire effort can be funded up front, an organization can also choose to first fund the design effort, and wait to fund development until after it sees the blueprints (Foshay, 1997).
- Identified marketing and maintenance, which recognize that, without a promotional effort, most websites are invisible to their intended users. Material on the Web is dynamic and requires ongoing revision, and the process must incorporate marketing and maintenance activities (Hartley, 2001).
- Results focused. That is, each phase is defined by its end result, rather than the activity that occurs during that phase (D. Robinson & J. Robinson, 1989).
- Adaptable to constantly changing content. That is, some web content is dynamic—it changes constantly. Some examples include price lists and answers to technical support questions. Processes need flexibility so that content can be designed early, but updated on a regular basis.

In short, rather than thinking of project management, usability, writing, visual communication, editing, and collaborative work as isolated topics, these development processes integrate them, state when in the development of a website that technical communicators need to address these issues, and often suggest how.

Realistically, however, these processes prescribe ideal practice; they do not describe the way people actually design and develop content for the Web. In fact, if web development bears any resemblance to other types of development efforts, only some of the activities will be universally performed on all projects (Wedman & Tessmer, 1993; Zemke & Lee, 1985). In some organizations, too, development is likely so chaotic that formal definitions of activities will not work (Hackos, 1994).

Still, our job in academe is preparing students for ideal practice, and developing the intellectual acumen to assess how to adapt ideal practice for the situations that practitioners face. Note, also, that this process for designing and developing content for the Web easily adapts to the design and development of all technical communication products.

INCORPORATING A PROCESS-ORIENTED APPROACH INTO THE CLASSROOM

A variety of approaches can be used to incorporate the process-oriented approach into the curriculum for undergraduate majors and graduate students in technical communication. This section addresses them. Specifically, it addresses the following andragogical issues: What are possible uses of the process? At what point in the curriculum should the process be introduced? In which courses? Which teaching assignments and methods support learning about the process? Note that I prefer the term *andragogy* (the education of adults; Knowles, 1980) to *pedagogy* (the education of children) because even traditional college students are legally adults.

Using the Process as an Organizing Schema

One possible use of the process is as an organizing framework for the curriculum, especially for undergraduate programs and terminal master's programs. Although it is not the only schema for organizing the content in technical communication, organizing around a process offers three advantages, especially when the Web is involved. First, many popular web design texts (e.g., Rosenfeld & Morville, 1998, 2002) take a process-oriented approach. Second, the process approach mirrors preferred practice. Finally, the process approach integrates the disparate competencies to practice and shows students how the pieces fit together.

When to Introduce the Process

Although I have found that most practicing technical communicators and academics in the field are enthusiastic about the broadening scope of work that has emerged in the past two decades, I have also found that the breadth overwhelms most newcomers to the field. They think the job is primarily about writing. The additional tasks create anxiety, and even scare them away. For example, user analysis requires extensive research skills that many newcomers do not have, the complexity of publishing technology is admittedly off-putting, and discussions of business issues often play at odds with people who expect that writing for a living precludes such considerations.

At the undergraduate level, avoiding the anxiety requires a phased introduction to the technical communication process. Most introductory texts on technical writing introduce the concept of up-front planning by stressing the importance of defining the purpose and audience of the communication product. Formally integrating such planning into assignments provides students with their first introduction to the broader responsibilities of professional technical communicators. In many schools, introductory courses include a large number of learners from other majors. They benefit, too, from formally integrating planning into assignments, by learning that technical writing involves the up-front work.

Later courses for undergraduate majors can introduce learners to the full extent of the process, and different schools use different courses to do so. In some schools, project management courses serve this role. For example, the University of Minnesota used to offer such a course. The focus in project management is usually on estimating and budgeting, as well as collaborating with others. Other schools offer a production course, like Bentley College. Production courses focus almost exclusively on issues of designing, producing, and duplicating golden code. Other schools offer web design courses. These courses usually discuss the process in its entirety, but apply it to all types of web pages, without showing how it also applies to the development of other types of communication products, especially printed technical communication products.

These courses pose two problems. The first is that most are elective courses. Students who do not elect to take these courses do not learn about the process, even though it is central to all work in technical communication. The second is that each takes a limited view of the process—approaching it either as a project management tool, production issue, or an issue that pertains only to the Web.

The University of Minnesota addressed this concern by combining its visual communication and project management courses, along with document design, into a pair of required courses—one taught in the fall, the other taught in the spring. For many in the field, document design is the central course in the field because it presents the key principles on which technical communication is based. Integrating it with project management and visual communication links all of these issues into a coherent whole.

Introducing the process into the graduate level poses a different set of issues. Although some graduate curricula in technical communication essentially duplicate undergraduate curricula, the expectations for learners differ among the levels. For example, many schools expect graduate students to assume higher level positions after graduation. So, although the entire range of the technical communication process might overwhelm new graduate students, one might argue that they need to become familiar with the process as early in their education as possible. Many graduate programs include a course on information or document design; some even require that learners take the course within the first or second term of study. This seems like the ideal course for an introduction.

Software documentation and similar courses also offer opportunities to introduce the process to graduate students. But like the counterpart courses at the undergraduate level, most such graduate courses are offered as electives, meaning that some students could graduate without learning about the process. That is especially likely for learners on an academic path, who will continue onto a PhD.

Teaching Assignments and Methods that Support Learning About the Process

Several educational goals underlie the introduction of a process-oriented approach to technical communication:

- Familiarizing learners with the entire range of activities needed to publish online content
- Familiarizing learners with business issues involved in publishing online content, including budgets, schedules, and marketing
- Familiarizing learners with the technical issues involved in publishing content online, including selection and use of authoring and content management platforms, and use of authoring tools

- Familiarizing learners with the research methods used to explore the audience and purpose of a project
- Familiarizing learners with the range of genres available for presenting content online
- Familiarizing learners with the different methods of structuring online content
- Familiarizing learners with the techniques for validating designs
- Familiarizing learners with the techniques for communicating online, including techniques for communicating visually and interactively, in addition to verbally
- Familiarizing learners with the quality assurance methodologies, including editing, usability testing, and assurance tests

No single course can address all of these goals, but because technical communication is a problem-solving discipline (Flower, 1978), students learn best when they experience the process holistically. The following sections describe two ways to introduce the process-oriented approach into the classroom. One pertains to service and problem-centered teaching, the other pertains to planning.

Problem-Centered and Service Learning

According to Dabbagh, Jonassen, Yueh, and Samouilova (2000), teaching a process-oriented approach can take two forms. One is to use the process as a means of organizing the course. That is, the course would begin with needs analysis and work its way toward production. The challenge in offering only a process-oriented approach is to ensure that students perceive the process not as a formula, but as a series of steps that require reflection, thought, and perhaps adaptation in response to new information. In practice, however, many find that focusing only on the process limits learners' thinking, because they approach development like a computer program, rather than as a series of problem-solving challenges for which the process provides guidance, not definite answers.

The problem-centered approach addresses that concern. In problem-centered learning, students are presented with a design challenge early in the semester and must work their way to the end. Through this form of experiential learning, students learn where following a process can be effective either by doing so, or from the consequences of not doing so. Terrance Skelton, a professor at Bentley College, uses a problem-centered approach, giving students the software SimCity and telling them to write the instructions for using it. The students must learn the application themselves because they do not receive a copy of the user's guide. Through this experience, students learn to write instructions from a user's point of view. I have used this approach too. In my course, students prepared parts of a help system for a new software application being developed by a new enterprise in a business incubator at my then-college. The situation introduced students to real-world issues: gaining approval for plans from the developer, working with software whose design may change between approval of the plans and development of the help, coordinating screen designs and terminology with developers of other parts of the help system, and producing final screens on deadline.

When such assignments are not available, I have found that service learning provides a basis for problem-centered learning. Service learning provides students with an opportunity to produce technical content for a community organization. In the process of identifying and addressing the organization's needs, students learn about the process for developing technical communication products in the real world. For web-based technical communication projects, that usually involves assigning students the challenge of writing how-to articles, procedures, policies, or guided tours, whether for the campus community or for a nonsectarian, nonpolitical nonprofit agency. All problem-centered learning provides students with the opportunity to experience the challenges of implementing a process in the real world. They learn to deal with deadlines, subject matter experts, inconsistent information given by different people in the organization, and weak or late reviews of their drafts.

To make a service-learning project successful, a staff member or volunteer from the organization must be willing to hold at least two 1- to 2-hour meetings with students, review student copy, and provide helpful and prompt feedback.

Focus on Planning

When newcomers to the field are introduced to the full process for developing technical communication products, it can overwhelm them. The up-front analysis can seem daunting, the accountability issues inherent in the development of evaluation instruments can bring their own form of "text anxiety," and the complexity of publishing technology can be off-putting to someone who is not familiar with it. Addressing these concerns requires a phased introduction to the process. Rather than introduce the entire process in an introductory technical communication course, students are better off becoming familiar with a simple process of first planning and then implementing and using traditional word-processing tools for desktop publishing tasks. An intermediate course could introduce students to additional complexity, such as additional complexity in planning, and professional desktop publishing tools. Advanced and graduate courses could introduce the process in its full complexity, and focus on methodologies for some of the up-front analysis, goal-setting, and design activities.

For an Introductory Course (such as Technical Writing I). Although technical writing texts and courses encourage students to plan in advance, few students actually do it. One way to develop the habit can be to require students to submit a Planning Form with each assignment in the introductory technical writing course. By marking the form to show students how their incomplete planning led the communication product off track, students can see the value of up-front planning to help them better target their work. I have adapted a form from Pfeiffer's *Technical Writing: A Practical Approach* (1999). Figure 12.2 shows a sample of the adapted form.

By including planning in an introductory undergraduate course, we can encourage students to develop good professional practice, not just for assignments focused on the Web, but for all types of technical communication assignments. However, limiting the scope of planning in the first experience helps ease students into planning as a regular process.

For an Intermediate Course (e.g., Advanced Technical Communication or Online Help). One can match students' growing sophistication with more in-depth guidance in planning communication products. These courses usually explain how to develop communication products such as online help, and in the process of doing so, they introduce concepts such as audience and task analysis, usability testing, and outlining. Figure 12.3 shows an adaptation of a format called a *concept sheet*, which has been used by public relations and marketing communications firms to help with these tasks. An instructor would remove those parts of the form that the course does not address.

Notice that the concept sheet uses some of the approaches recommended by user-centered design and performance-centered design (Gery, 1995). These include the following:

- A variation on use cases called *bottom-line tasks*
- Use of archetypes (called character sketches) (Cooper, 1999)
- Flowcharts of content (also called information maps because they show a map of the information—not to be confused with the Information Mapping® system)
- Storyboards or wire frames (an idea proposed many years ago by Weiss for printed documentation, but not incorporated into standard practice until content moved to the Web)

This intermediate level of planning helps undergraduates take their planning skills to the next level. This is an appropriate starting point for graduate students. More is expected of them, so the sooner they learn the process in its complexity, the more depth they can mine from it.

For Advanced Courses (courses in specialized genres of communication and project management). Planning becomes even more elaborate as students' sophistication grows. These courses walk students through the experi-

Planning Form

1. Complete this statement: After reading this document WHO will be able to do WHAT?

2. **More about the audience:**

   - Its role in decision-making process (circle one):

     Decision maker   Decision influencer   Decision receiver

   - Its tolerance for information (circle one)

     Nibbler   Grazer   Hearty appetite

3. **More about the purpose:**

   - What supporting points must readers master to successfully accomplish the purpose?

   - What response or action do you want from readers to take after reading this information?

- **Therefore:**

  - How much information should you provide the audience (circle one)?

    A lot   Some   Very little

  - What information would be most useful to the reader?

  - What information does the audience need that will be difficult for them to recieve? How do you intend to handle the problem?

FIG. 12.2. Example of a basic planning form.

General Overview

Write a one-paragraph overview of the request for a communication product, using this format:

> I have been asked to write a ***(type of communication product, fill in the name, such as a user's guide, online help, or tutorial)*** about ***(fill in the topic name, e.g., the name of the software or hardware product, or the general subject area)*** for ***(fill in the name of the intended users)***. When the users have read this communication product, they should be able to ***(fill in the blank with words describing what people should be able to do, e.g., use the product, install software, or the like).***

1. Needs Analysis

- **Business need:** State why the sponsor wants to invest resources in developing this communication product. That is, if users can perform the tasks described in the product, how will that benefit the sponsor?

- **Tasks:** First present a paragraph that describes the one "bottom line" task that users should be able to perform (e.g., install a product), and then offer a summary of the other skills and knowledge they need.

Next list:

- Five to seven main tasks that users should be able to perform after using this communication product.
- For each main task, give five to seven supporting tasks--that is, tasks users must be able to perform to successfully complete a main task. (For example, to complete the main task of starting a system, users must be able to complete the supporting tasks of using the power button and entering a password.)
- **User groups:** Describe the intended users of the proposed communication product. Provide:
    - Demographics: job titles, experience, previous knowledge, and motivation for using the information (must use it, should use it, or might find it nice to know how to use it)
    - Character sketches of 2 or 3 typical users in that category
- **Project constraints:** Identify constraints on:
    - Schedule (e.g., a firm completion date that must be met)
    - Budget (e.g., a "not-to-exceed" cost)
    - Quality (identify quality standards, such as editorial guidelines, and other characteristics that the proposed communication product must conform to)

2. Goals

- **Objectives:** Make sure that these are stated in observable and measurable terms.
    - Business objective: Explain, in observable and measurable terms, how the technical communication product will contribute to revenue, contain expenses, or comply with regulations.
    - Content objectives: Same as the tasks (in a full information plan, you would provide some additional measurement information).
- **Evaluation:** In a sentence, explain how your sponsor can observe whether the communication product has achieved its goal.

FIG. 12.3. *(Continued)*

3. Form of the Communication Product

Form: Given that you have been instructed to write a certain type of communication product such as a user's guide or reference, explicitly name the expectations that users bring for that form. Specifically, describe or list:

- The purpose of this type of communication product
- The "must-include" information
- The tasks commonly addressed by this type of communication product
- The standard structure for this type of communication product
- The writing style for this type of communication product

4. Describe the Function

1. Present a complete flow chart for the communication product, including:

Front matter (only include the components that apply)	▪ Title screen ▪ Help About or other type of edition ▪ Table of contents or site map ▪ Preface
Body	Represent as an information map—a flow chart of sorts that visually shows the structure of the information (rather than an outline). When creating the information map, make each main objective a major point; and make each supporting objective a supporting point.
Back matter (include the components that apply)	▪ Appendixes ▪ Index ▪ User Feedback Form (also called Reader Comment Form)

2. Provide a detailed page-by-page or screen-by-screen description of the communication product. For each page or screen, give the following:
    - A page or screen identifier
    - A description of the content and of how it will be presented
    - Production instructions
    - Programming instructions

   These ideas are often best presented in storyboards or thumbnails.

5. Quality Guidelines

Designs for the most common types of displays (pages or screens)	Such as the home or title page, section introductions, presentations of procedures, presentations of reference materials, and examples.
Editorial guidelines	Style guide and dictionary to be followed, as well as exceptions
Technical guidelines	Configurations and other technical details of the authoring and desktop-publishing systems

FIG. 12.3. Example of a concept sheet.

ence of developing evaluation instruments (such as user scenarios and satisfaction surveys), setting editorial guidelines, and setting schedules and budgets. The planning form can be further enhanced to guide students in performing these tasks.

IMPLICATIONS OF A PROCESS-ORIENTED APPROACH

The emergence of a complex, multidisciplinary design and development process for professionally prepared web content has a variety of implications for the curriculum in technical communication programs. One implication involves further distinction between courses for majors at the undergraduate level and service courses in technical writing. Service courses in technical writing prepare students to write brief (less than 20 pages) functional documents, which will primarily be read by known colleagues. Most of these documents are printed. In contrast, a program for majors ultimately needs to educate students in the preparation of lengthy functional documents (at least 50 topics)—or brief ones that work in conjunction with other documents—and that primarily will be read by people whom the author does not, and will not, know. As organizations increasingly publish the majority of their user documentation, policies, and procedures online, most of the professionally produced content is intended to be published and read online.

A second implication of a process-oriented approach involves its potential to organize the disparate pieces of a professionally oriented curriculum into a coherent whole. Introducing the process in each course shows students the broader stage on which they perform their work. For example, in a course on editing, the instructor can use the process to demonstrate the practical applications of the levels of editing: the setting of editorial guidelines during the design phase, substantive edits during the development phases, and copyedits during the production phase. Similarly, courses on visual communication, which typically address layout, data visualization, visual rhetoric and, occasionally, graphics production, can show when screen design guidelines are established, how data visualization techniques can be used to communicate design ideas, and how the practicalities of producing layouts and graphics can function within the constraints of the production software. Using the process to structure the curriculum is common to instructional design programs.

This process-oriented approach also suggests a division of educational emphasis between graduate and undergraduate programs that roughly matches the division of labor among information designers and information developers. That is, information designers perform the more abstract assessment and design activities, whereas information developers perform the more concrete development, publishing, and maintenance activities (Carliner, 2001). This suggests a natural division among the graduate and undergraduate curricula. A terminal master's program would prepare students to become information designers, and would then focus on issues of analyzing communication problems, setting objectives, evaluating effectiveness, choosing genres, choosing design strategies, establishing guidelines, choosing a technology platform, and working within a business environment. A bachelor's program would prepare students to become information developers, and would focus on more basic writing, editorial, visual communication, production, and project management skills. Such a division of education is proposed by Willis (1990), who suggested that a bachelor's degree prepares a person to "*do*," and a master's degree prepares a person to lead or manage the "doing." In addition, this division of labor suggests that master's students should have developed the competencies expected of information developers, and that this type of activity is not suitable for graduate credit.

Although, in theory, this distinction sounds appropriate, a review of most of the terminal master's degree programs in technical communication show limited differentiation from bachelor's degree programs at the same schools. The curricula for many terminal master's programs are built on a core of double-numbered courses: that is, single courses open to both undergraduate and graduate students (STC, 2001). Although graduate students are supposed to perform additional work in individual courses, the education they receive does not substantially differ or offer significant advancement from the undergraduate degree. Furthermore, if master's students use required courses to master basics such as writing and editing, then the curriculum does not leave sufficient time to address more complex topics, such as mass-customizing information.

A fourth implication involves the theory and research underlying our curricula. Within the professional world of web development, two camps have emerged. One is the usability camp, which looks to quantitative studies for guidance in developing websites. The other is the graphic design camp, which looks to art and time-honored design principles for planning and developing websites. Sites lauded by graphic designers are quickly dismissed by usability experts as unusable; sites lauded by usability experts are dismissed by graphic designers as dull and boring. As Cloninger (2000) noted, the extremists in each camp have entrenched themselves. And, as Robinson commented, each side only has it partially "right":

> So, I think analysis and intuition will, and should always, continue to coexist. There are always going to be extremists from the intuitive side who'll say any kind of research, any kind of planning, squashes their creative abilities. Well, those guys are going to lose. If you continue to take that hard line there's not going to be much of a place for you, because the nature of the problem has changed so much. The other extreme, however, is just as bad—where there is no place for intuition; where there is a belief that everything can be predicted or modeled or planned out. The way we think about planning, and research to support design, is that the best creative solutions come from really informed groundwork. (Interview with Rick Robinson, 2000)

In all of these debates, views from each end of the spectrum, as well as those in between, have merit, and need to be represented in courses. And, as Spilka (2000) notes, we also need to become more involved in defining quality professional technical communication.

The last implication is the importance of hands-on experience with web development for teachers of web development. The process-oriented approach is a prescribed one; although one can theorize how prescription might vary from practice, the truth is that each web development project—like each communication problem—is unique, as are the issues that arise during it. As the depth of student understanding and learning grows from internship and work experiences, so the depth of our understanding and teaching grows from hands-on experience. We can learn the practical challenges of documenting software only to learn that the content is in flux. We can learn about the challenges of maximizing the graphic appeal of a website while minimizing file size for transfers over conventional phone lines. Similarly, faculty can learn about designing web layouts that work perfectly in one browser, only to find that they cause error messages in another. This hands-on experience also adds to our credibility in the classroom and in the professional community. Certainly designing course and department websites gives us some hands-on experience; experience in industry—whether through faculty internships, consulting, or research—offers more significant opportunities.

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Online? *Is There a* [Web] *Text in This Class?*

Susan Loudermilk
Texas A & M University—Corpus Christi

> *On the first day of the semester a colleague at Johns Hopkins University was approached by a student who, as it turned out, had just taken a course from me. She put to him what I think you would agree is a perfectly straightforward question: "Is there a text in this class?" Responding with a confidence so perfect that he was unaware of it (although in telling the story, he refers to this moment as "walking into the trap"), my colleague said, "Yes; it's the* Norton Anthology of Literature,*" whereupon the trap (set not by the student but by the infinite capacity of language for being appropriated) was sprung: "No, no," she said, "I mean in this class do we believe in poems and things, or is it just us?" (Fish, 1982, p. 303)*

> A Third Sophistic, *or* Postmodern/ParaRhetoric, *would be, or* is, *an "art" of "resisting and disrupting" the available means (that is, the cultural codes) that allow for persuasion and identification; the "art" of not only refusing the available (capitalistic/socialist) codes but also of refusing altogether to recode, or to reterritorialize, power relations, whether they be manifested in the idealogies of a State Philosophy, Ethic, or Religion. It is especially* "counter" *to "simple categorical heterogeneity"...* A Third Sophistic Rhetoric *is interested in perpetual decodification and deterritorialization. Moreover, it has* no *faith whatsoever in the "game of knowledge." (Vitanza, 1991, p. 133)*

Although we have moved beyond the understanding of text that Fish (1982) refers to in this story from his well-known text about reading processes, and have yet to move completely into the "Third Sophistic" that Vitanza (1991) speaks of, I think both discussions of textuality can be helpful as we seek to prepare students for the rapidly changing contexts of writing, specifically within the context of the World Wide Web, taking into consideration the effects that technology has on our classroom practices. What I contend that we need in our technical writing classrooms at this point in time/change, this point of juncture/disjuncture between/among hard/soft texts, is a *ParaRhetoric* that allows us to function in the world of both written discourse (hard copy texts) and electronic discourse (online texts) as we re-vision our roles as technical communication teachers and students, as learners in a tech-web world, and as technical communicators.

I use the term *ParaRhetoric*, which I borrow from Vitanza (1991) to refer only to what I believe we need to think about in terms of the Web at this juncture/disjuncture in "time." It is meant to be a sort of in-between way of looking at our theoretical views at any point in time and asking ourselves what are we seeing now and what can we see if we look beyond/away from/into these theories. The Web, I believe, moves us far away from ground where we can stand on theory and apply it to texts in the more traditional, historical sense of meaning making. Thus, I propose "this" ParaRhetoric, and I use the word "this" purposely to refer to this ParaRhetoric rather than "a" or "the" because it is not meant to be seen as the new way to use the Web in the classroom, but rather as a way that takes us through Web-based text today and gives us a glimpse of what to look for beyond that. This ParaRhetoric is meant to disjuncture and fragment those systems, those theories that inform who we are as technical writing students/teachers/learners, so that we can see beyond those roles in order to be able to take advantage of where the Web may be leading us.

This ParaRhetoric calls for a different model of textual interpretation, for a different model of textuality. In order to further define what I am advocating with this ParaRhetoric, I will use three terms here, some more loosely than others, but I will use them "differently" than we traditionally think of the meanings for these terms, in order to bring attention to the theoretical changes that I am proposing. First, the term text is problematic even when we think only in terms of hard copy texts, as Fish points out. I will use *text* to refer only to the traditional, "historical" model of textuality that I wish to move away from. I will use the term context in place of the traditional term of *text* in order to encourage a different understanding of how we as tech-web teachers/students/learners function in/through/with information found in both traditional texts and online texts. The most important distinction I hope to make may come from my use of the term contextuality. The Web, I believe, offers us context within which we can begin to see the role/reality of textuality differently.

"DISJUNCTURED"/"FRAGMENTED"

I advocate that in order to prepare our technical communication students for the tech/web world of the Millennium, we need to envision the World Wide Web (which I refer to as the Web from this point further) as the context for our technical communication classrooms. To envision this, we have to move away from what I call a *historical model of textuality* and move toward what I call a *present/future model.* This ParaRhetoric calls for a move to resist and disrupt/disjuncture traditional notions of textuality, in terms of both written and electronic discourse. I prefer to move away from text with its static, inclusive connotations, and instead focus on contextuality as a fluxing, fragmented, present/future sense of thinking about writing and reading as technical communicators.

Because we find ourselves at one of those junctures in time when textuality is being redetermined, we need this ParaRhetoric that will take us even farther away from the static view of the text that Fish (1982) warns against, and enable us to shift to a lens that will begin to open up our vision of how the Web functions as a contextual means of information in our tech-web classroom experiences, so that we can begin to glimpse "Third Sophistic"? or whatever the Web is leading us to next in terms of textuality (Vitanza, 1991). The tech/web world of the new millennium is and will continue to become a very different textual space. As Mihalache (2000) describes, "Cyberspace is not a pre-existing void to be filled with moving (and living) particles of matter and thought, subjected to the universal laws of science and philosophy. It is rather an entity on the make, an unending surface of intersecting, but not necessarily interacting discourses, each developed according to its own assumptions and rhetoric." How we prepare our tech-web students to enter this "unending surface of intersecting" is a very important issue to address.

Shifts in determining textuality are certainly not new. Just as the advent of the printing press began to cement the notions of the static text and authorial intent/control into our consciousness, theorists such as Ong (1986) and Snyder (1996) point out the similarity between orality and written texts, with the Web being similar to orality in that it invites a sense of community participation and a more present view of meaning making. Some describe these shifts as going from orality to literacy to electracy.

These examples illustrate the need for this ParaRhetoric in order to get tech-web students to look not only beyond their longheld indoctrination of the text as the container of knowledge, but also beyond beyond, to Vitanza's (1991) notion of "some more." This ParaRhetoric is not a new theory meant to displace one theory at the expense of another, but an attempt to obvert the subversive beliefs about textuality, both written and online discourses, an attempt that may keep us from falling into the trap of thinking we have figured out the Web as a text in the same way that our Romantic history caused a consciousness that views the text as authorial static fact containers. Without this ParaRhetoric, tech-web students may come to believe that to understand the Web today means they will understand the Web tomorrow. Such notions of textuality were easier to hold on to with hard copy texts, but with the Web, the mask of mis-reading is removed every day, removed with every screen, and if tech-web students do not use this ParaRhetorical vision to read the Web differently, their preparation for technical communication in the future may be limited.

ParaRhetoric is a slippery term, and I use it intentionally so, because my experience in working within the Webbed classroom has shown me that I can only hold on to things for a limited amount of time. What I have to do instead, is keep reminding myself that the way I look at the Web and the way I encourage my tech-web students to think about and look at the Web are more important than (miss)believing that I have captured a system that will insure a successful navigation of the Web each time I go there, or each time I send my students there. So as tech-web teachers and students, we have to retrain our vision to look for glimpses instead of set structures, and to understand that glimpses are all we have. And we have to learn to read those glimpses on the Web as contextual opportunities to enter into and enter out of, as we read and write on the Web.

"SOME MORE"

This ParaRhetoric I envision at this point in time is "fragmented," "disjunctured," "some more" (again building on Vitanza's, 1991, discussion). Application of this ParaRhetoric is made much more possible because of the nature of hypertext communication. As many theorists, such as Landow (1987) and Lanham (1993), have pointed out, the cursor can be seen as representing the presence of the reader in the text more physically, more visibly than we experience when reading traditional text. Murray (1997) reinforces the presentness of the model I advocate as she discusses the instant results that come from clicking from screen to screen in hypertext. Patterson (2000) also describes this shift from hard text to online writing, saying that "hypertext makes us conscious of the blurring of the reader/author role. Book technology seems to fix our notion of authorship, while hypertext challenges us to rethink that role and the role of the reader" (p. 76). I do not believe that this ParaRhetoric I describe here will completely change our views of our roles as tech-web teachers/students/learners, but I do believe that these views and roles will change as well as a result of the re-vision of textuality that may come from thinking about the Web as a present/future place to shape and share "some more" "disjunctured" "fragmented" information, a place of contextuality.

I believe that Fish's (1982) theory of reader response, going back to his description of the discussion that his student had with the other professor, complements Vitanza's (1991) idea of "some more" and fits with this ParaRhetoric, which uses the Web as context for our communication classrooms, understanding this context as a "fragmented," "some more" (Vitanza's terms), contextual community, "always forever unknowable and disruptive" (Vitanza again, p. 127). Murray's (1997) notion of the "interactor" as a "navigator, protagonist, explorer, or builder" also describes the roles that this ParaRhetoric defines for both tech-web teachers and students (p. 153). This ParaRhetoric becomes a means of preparing our tech-web students to realize that the Web is not a container of text, but rather "a changing object" (Fish's description), and not the ultimate repository of text. This ParaRhetoric, therefore, places tech-web students in situations where they go into the Web to practice and experience what I advocate that technical communicators do—they gather, analyze, and present information within hard copy/online contextual communities.

As Shirk (1997) points out in "The Impact of New Technologies on Technical Communication," "Electronic links not only provide new perspectives on the *nature and structure of texts* [emphasis my own] but also redefine the creative process itself" (p. 186). She advocates that a "partnership" with technology "can enhance creativity, if technical communicators are willing to take risks with these technologies and not only undergo the effort in learning them but also have the desire to experiment with them" (p. 183). Shirk sees "the image of technical communicators as surveyors . . . of information, ideally located at the center of a web of data flowing in and data flowing out of their circles of creativity" (p. 187). Vitanza (1998) tells readers of his text *Writing for the World Wide Web*, "Go Web, Young Men and Women . . . venture into Cyberspace!" And in order to help them understand "the necessity for [them] to live in two radically different cultural environments on paper and on monitors," he advocates that students become "porpoises," the "motive" being not to "take an intermediary step to altogether leave the water, but to live and dwell in both print and the WWW in the most successful way" (pp. ix–x). Both Shirk and Vitanza underscore the present/future situations in the world of tech/web communication and illustrate the need to situate tech-web students in this/these situation(s). By grasping this ParaRhetoric that enables us to more fully envision the role of the Web as a text in/for/of our tech-web classrooms, I believe we can begin to give tech-web students experiences to help prepare them to be effective technical communicators in the new millennium.

As we shift between paper and electronic mediums, tech-web students need to understand the contextual nature of both, and to translate connections and make necessary decisions in each format. As we prepare students to become technical communicators, we need to explicitly discuss how to gather, analyze, and present information in the tech/web world. The Web places tech-web students in situations that help them to understand that there is no one, ultimate/historical container of everything, but instead multiple sources exist with multiple origins, multiple architectural structures, multiple purposes ("porpoises"?), multiple connections, which are all multiply changing. The Web is changing, and changing quickly, as we are well aware. Tech-web students need to understand that what they view when they vision the Web today in my class will change quickly, and they will need to constantly re-vision their way of looking in and through the Web each time they come back to it. Thus, this ParaRhetoric for re-seeing the Web in the tech-web classroom can help students to shift from the historical view of textuality to a present/future view of textuality, and to think instead of the Web as the contextual community for our tech-web classrooms.

INSIDE A PARARHETORICAL CLASSROOM

Some of the activities that I use in my tech-web classrooms are designed to attempt to get tech-web students to use this ParaRhetorical view of who they are as writers and readers in a space where hard copy and online texts disjuncture. Although I tell my tech-web students that I certainly do not expect them to be computer experts, I do encourage them to always be informed about the larger issues that affect the technology they use and the communities within which they use the technology to communicate. The assignments that I use in my tech-web classrooms are meant to encourage students to begin to adopt this ParaRhetorical view of the Web and to begin to rethink their roles as tech-web students/learners and my role as the tech-web teacher. This "fragmented" "disjunctured" "some more" approach changes not only my role, but also places students in a position that can be uncomfortable for them. In the classroom where the Web becomes the contextual community, traditional student/teacher/learner roles are disrupted. Students may still look for direct paths that will guide them to first, an acceptable "grade" for the class, and second, a "knowledge" that will make them "experts" in their field. I contend, however, that there are no "experts" in the traditional sense of "knowledge" in the "game of knowledge" Vitanza (1998) referred to, only as he says, "porpoises."

To cite one practical example before I go on, one traditional model of teaching in the technical communication classroom usually involves developing some type of manual as one assignment. The assignment may go something like this:

> *We are going to learn how to develop manuals. Pick a topic of your choice and gather the information for the document. Then, using the following guidelines (which vary by teacher) create a manual.*

In a tech-web classroom where this ParaRhetoric informs student experiences, tech-web students would take a problem, determine how to solve it (which may or may not involve developing a manual), gather the information, understand where the information comes from and how it is delivered and what the social, political, software/hardware implications of those frameworks are, and then determine the best method for delivering the information (hard copy/online texts, combinations of both, searchable databases, interactive websites, etc.).

So what do we have instead, when we see the Web as the contextual community for our tech-web classrooms and re-vision our way of looking at/in/through it using this ParaRhetoric? In order to try to illuminate how this ParaRhetoric may affect tech-web students, now I discuss in more specific detail a few of the activities that I try out with my students.

(Re)Visiting the Library

One introductory type activity that I use is intended to help tech-web students see and better understand the connections between hard contexts and online contexts, especially in terms of moving beyond where we currently stand, or in other words, to see where we are presently and where we could be going in the future. I assign a library exploration project to identify the similarities between traditional library databases and their additions/conversions to an online environment, and to speak to the future of library resources on the Web. (I use the library as the context here, but this activity could work equally as well focusing within any context, e.g., scientific journal contexts.)

First, I ask the students to find a library on the Web that is a complete online library, or in other words, a library resource that exists only in cyberspace and is not tied to a traditional library structure. Some ParaRhetorical questions we begin with are "Do such entities even exist?" and "If they do exist, how are they structured and what are their larger purposes." I discuss the way that traditional libraries started in this country, including the economic issues and the issues of access to information in libraries by different segments of the population. I draw parallels between how those libraries were formed and how the Web is being formed. If these libraries had been put together the way the Web has been up to this point, then it would be the equivalent of all of the students at the university going to the library and placing every essay/report that they write, including personal writing that they do, on the shelves in the library, and in a dis-order that makes it much more difficult to find than the system we have for finding the information that is currently found in the traditional library. As students find lists of so-called online libraries and get further into this activity, they begin to resee the connections between traditional and online libraries on the one hand, and the connections between retail units and online libraries on the other hand, and the ways that information is collected and presented in online libraries.

I ask the students to draw a diagram of the structure of an online library based on our discussions of how information is stored online, and then to compare that structure with what they find on our university library web page. The students draw a diagram of that structure as well. I ask the students to look at the university library online resources using ParaRhetorical questions. Because they have seen and used it so many times before, but perhaps have never thought about these larger issues, I want them to look beyond what they traditionally see. The students then go to the actual physical library building and draw a diagram of the physical path for finding the information in the hard texts. I then ask the students to write reflectively about what they saw, including the differences/similarities they found and the advantages/disadvantages they see in each one, why they think the three different structures are set up the way they are, what each system says about the theory behind gathering information for access in a "library" scenario, and what changes they think they will see in the area of "library" scenarios in the future.

By having the students gather, analyze, and present the information about libraries on the Web, based on our discussions of how databases are built from our readings in hard copy texts, and then having the students compare that information with the actual library database at the university and present that information to our classroom community, the students are exposed to one example of how we function in the worlds of both written and electronic discourse. This activity fits this present/future ParaRhetoric that I advocate in that students examine the present status of libraries, both online and in buildings, and think about the changes that have been made, the changes presently occurring, and then relate those changes to what may happen in the future. These foci are not centered only on the traditional sense of understanding catalog systems, but rather move beyond that structure and examine the political and social, as well as the technological structures that make up the contextual communities of libraries and library users. As the students look at the present "disjunctured" "fragmented" library structures, they also look away from these and look toward the future of where the structures may go next.

(Re)Searching the Web

Before sending my students out to search on the Web, I ask them to begin with their traditional notions of text and then go in and (re)search the Web. This way I seek to disrupt their notions of searching the Web. This activity builds on the library activity to provide further exploration of search engines. The objective of this activity is to begin to better understand the theory behind how the Web is set up and how it is evolving.

First, the students are asked to conduct a "How to Search the Internet Guides" search. The objectives for this activity are to learn what is being said about how to search the Internet, to learn tips and techniques for searching the Internet, and to evaluate the available information about searching the Internet. As students conduct searches of the Web, I initially ask them to map out on paper the paths they take and how these paths juncture/disjuncture, and to explicate what this means for them as gatherers of information.

I believe that if I take a more traditional approach, and instead of sending them out to find information I take them to the places where I believe "valid" textual information can be found on the Web, then I am not asking them to function in the tech/web world. This ParaRhetoric that I advocate involves the students in determining where they go and why, and makes them ultimately responsible for determining how those searches create the contexts for their meaning searching/making.

Instead of developing web pages for students that provide long lists of where to find the best information on the Web and all of the questions to ask when they look at the sites, instead of giving students examples of good and bad sites and telling them why they are bad sites, we as tech-web teachers should provide some initial points of contact in order to place the students in tech-web situations where they must then decide which way to go beyond those initial contacts, and what questions to ask once they go there. Much as if the students were my employees or colleagues, I tell them what I know or who I know related to a project/problem, and it is then up to them to navigate beyond the initial entry points that I may provide, and to understand that at every juncture/dis-juncture there will be "some more" questions to raise and issues to address.

As tech-web teachers, we need to be careful not to transfer historical/text-based pedagogies to the contextual community of the Web. We must help our students develop ParaRhetorical thinking that will enable them to question how information is gathered, including thinking in terms of the social, economical, and structural issues that affect this process, thinking that will enable them to determine what approach to use to analyze this information, to see each project as a different way to deliver information, and to see that each project requires different questions. For example, if students plan to become technical communicators in the field of criminal justice, then we should prepare them to determine the larger structures/decisions that determine what information is reported, how it is gathered, and how it is presented. If tech-web students instead approach the Web with a traditional perspective, then they will not become effective technical communicators in the tech/web world of the Millennium. Because the Web is "fragmented," disjunctured," "some more" spaces, tech-web students should be taught to understand that their role goes beyond simply gathering information and includes understanding how the information came to be available in the first place, and how those structures may be quite different when they return to them.

PRESENT–FUTURE

Tech/web students may feel the disjuncture of such activities because of the role of student/learner they believe they must occupy. I no longer view my role of teacher as being the person who can guide them where they need to go on the Web; I can only give them glimpses of what I have seen and experienced. They must also move beyond the constraints of the historical student/learner and do "some more."

An important part of using this ParaRhetoric within my tech-web classrooms is the resulting theoretical changes as we re-vision our roles as tech-web teachers/students/learners, as users of the Web as a contextual community. Instead of pretending/believing that I am the keeper of the information within the historical model of textuality, I hope to become instead a coach, a manager, a stakeholder, a fellow meaning-maker/navigator in the learning that is taking place in the present/future sense. I do not believe that I can go into my tech-web classrooms with the attitude that I have a body of artifacts to pass on to the students, presented for their "mastery." I, instead, guide tech-web students into situations as they happen within the settings of the Web and encourage them to think about the Web within the present/future model of textuality in order to practice this ParaRhetoric; I believe this ParaRhetoric will help them continue to function within the changing contexts from written to electronic discourse for the present, and to be successful in cyberspace communications for the future.

Students come to my tech-web classrooms at different levels of Web competency, so for me to say that I am going to teach about the Web within certain parameters, falling back to that historical model of textuality, is a fallacy, because the students will begin their learning experiences in my classroom with whatever knowledge they bring to the class about the Web. And for me to ignore new issues, new communication constructs, and new design elements just because I do not feel that I am "expert" enough in certain areas is a fallacy as well, because again, my students who are aware of these issues will be working within those contextual communities whether or not I acknowledge them. I must allow opportunities for students to prepare for the web writing/creation they will do as website creators/maintainers. Using this ParaRhetoric for re-visioning textuality within the state of flux between traditional texts and online webtext communities means asking what the Web does now and what it will do "some more," while realizing that we only get glimpses of where we are going, so we have to constantly re-look at what we see on that next screen, even if we think we are coming back to a place where we have been before.

So, "Is there a webtext in this class?" Certainly not in the historical sense that Fish warns us to push away from. Instead, the Web becomes the contextual community for the tech-web class, a community where we do not subvert the "infinite capacity of language for being appropriated" that Fish points out, and where we also do not subvert the opportunities for "perpetual decodification and deterritorialization" that Vitanza encourages us not to miss. There is a Web in this class. And that's about all I can say at this "disjunctured" "fragmented" point of "some more" until the next class.

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14

Moving Beyond "Text Only" Pedagogy: Oral, Print, and Electronic Media in Technical Communication Assignments

Rich Rice
Texas Tech University

Carole Clark Papper
Ball State University

Gathering, shaping, and delivering information—these are the critical processes of technical communication. Rapid advances in technology make teaching these processes both easier and more complex. Whereas teachers and students have ready access to efficient distribution tools like e-mail and the Web, any given audience has varied levels of access, experience, and confidence using e-mail or viewing web pages. Thus, keeping both rhetorical approaches and modern design problems in mind is vital, as Honeycutt and McGrane (chap. 4) point out in this text. And as Salvo (chap. 3) and Pullman (chap. 2) argue in their chapters, technical communicators must be taught how to be information architects. Technical communicators must know how to organize vast amounts of information to build complete and rich presentations of data sets. Indeed, technical communicators must gather, shape, and deliver information *kairotically*.

A complicating factor, especially in higher education, is the valorization of language, of words either spoken or written, over other modes of communication. Images, gestures and body language, nonverbal sounds, and other sensory-appeals fall primarily into a language-illustration/support role. We believe that teaching students *kairotically* (i.e., how to express the right things in the right amount at the right time) requires us to examine multiple modes of communication, especially given proliferating technological innovation.

Consider the chapter "Writing for the Web" in *Principles of Web Design* (2002). D. K. Farkas and J. B. Farkas highlighted three significant differences between writing for print and composing for the Web:

1. The Web medium encourages casual, restless reading behavior.

2. Web writing is not necessarily text. Sometimes we write for oral delivery.
3. The Web is a strongly non-linear information environment. (p. 220)

Students should consider how "patterns of behaviors develop around each communications medium" (p. 220). For example, the Web promotes quick "surfing" through content, whereas print or film media might encourage more sustained focus. In one project assignment, for instance, D. K. Farkas and J. B. Farkas asked students, "If your website will contain extended text, have you thought about [whether] this text is important enough to your users that they will be motivated to read it?" (p. 240).

Future Webs, as Barber (chap. 5) suggests in this collection, will be even more content rich than the ways information is presented and delivered on the Internet today. Technical communicators will thus need to consider motivation from the perspective of multiple discursive modes. Because technology tends to meld communicative strategies, behaviors specific to oral, print, or web-delivered media types are increasingly characteristic of all media types. Technical communicators must learn how to become multimodal document specialists, building on multiple patterns of behavior at all times in all media types. Current methods of technical communication instruction, however, have us teaching document preparation as a set of "decontextualized subskills of literate competence" which students can later draw from and apply as artifacts in various venues: texts for other classes, news articles for the student paper, content for web pages, and so on (Warschauer, 1999, p. 3). The traditional model compartmentalizes the holistic document preparation common in the workplace, restricting communication to the frame of text construction, teaching that "content" can simply be reshaped as needed and poured into any project. We propose a more *kairotic* form of designing assignments in technical communication courses, focusing on the medium and the message as the message. Instead of teaching technical communication courses only through the frame of text, attributes of the textual, the pictorial, and the aural should underpin the delivery and content of each assignment. Teaching composing through multimedia and multimodal communication strategies rather than "text only" methods and methodologies better prepares technical communicators.

THE NEED FOR MULTIMEDIA

Students immerse themselves in various media types: from the vibrant colors and anything-goes influences in the clothes they wear, to the rich variety of multiculturally inflected music they hear, to the mind-bending graphics and special effects they see in TV programs, movies, and on the Internet. They routinely engage in multisensory communicative activities. And as Papper and Fleckenstein (2003) note, multi-tasking in a variety of digital and nondigital media is common as students work on assignments. Is it any wonder, then, that these same students register boredom when faced with producing yet another single-page memorandum, 500-word essay, 2-page document analysis, or 10-page research-paper-with-MLA-documentation-and-proper-formatting?

When they start formal schooling, children learn eagerly, using all of their senses: They sing songs and make macaroni necklaces, they gleefully smear brilliant-colored finger paint on wet glossy paper, and they build worlds out of words as they tell stories and pretend and talk to each other constantly. Everything they do is learning; everything they do is play. Their first compositions are combinations of pictures and words, and sometimes the pictures are themselves combinations of different media: puffy white cotton-ball clouds stand out on a light blue tempera sky framing a pencil-drawn stick figure family standing in front of a cardboard house on a green construction paper lawn.

From preschool on, future technical communicators progress from play to serious work: They learn to read and then to write. They are encouraged to channel their artistic, expressive urges into creating carefully formatted texts: words, sentences, paragraphs, and essays. They leave behind fingerpaint and tactile learning, moving toward cognitive analysis and verbal construction. And this is as it should be. The world values logical thought, rational analysis, and clear and thoughtful expression. Success in the academy and in the workplace is predicated on success in writing and on effective mastery of the conventions of rhetoric. Yet, something is lost if we do not recognize that the richness of other construction materials can enhance learning and the expression of ideas. Communication has never been limited to one medium; even primarily oral cultures have left behind art, visual artifacts that speak to us across the millennia much more powerfully than words. The first step in designing effective multimodal courses, then, is to understand how communication and technology have worked and are working together.

What we are proposing is not easy. It is not easy to keep in mind that our students have many different backgrounds and rely on diverse ways of learning; and it is not easy to teach students that technical communicators' audiences are impacted by both technology and communication modes in many different ways. In fact, what we are proposing challenges conventional views of what makes "discourse." In the least, we are challenging the disciplines of both technical communication and composition. Are there differences, for instance, between the terms "writing" and "composing"? Certainly. But what are they?

A recent discussion thread on Tech/Rhet, a listserv sponsored by *Interversity: An Open Teaching and Learning Cooperative* for Tech/Comm and Rhetoric teachers and practitioners, focuses on defining some of these differences. The thread, "[techrhet] ease of multimedia in fyc?" (http://www. interversity.org/lists/techrhet), considers the implications of shifting our pedagogy from "writing" to "composing." Nick Carbone (2002), New Media Consultant for Bedford/St. Martin's Press, suggested, "Writing about words limits what we mean by composing. And that's usually been the shift—don't think of writing as writing, but as composition (painters compose, photographers compose, musicians compose, choreographers compose—the word transverses creative and communicative fields)." In other words, the term "writing" should denote more of what "composing" connotes. All technical communicators should include the kind of reflection and insight into rhetorical situations that can be associated with painters, photographers, musicians, and choreographers. It is clear in any case that technical communicators must compose meaning in reflective ways. Another Tech/Rhet member, Jeff Rice (2002), who is the director of the University of Detroit's writing program, reminds us that writing is just one form of communication:

> Just because right now "words" are the dominant form of composing, doesn't mean they always will be. We forget too quickly . . . that rhetorical instruction has not always focused on alphabetic writing, and its late 1800s entrance into the American education system has more to do with other factors than immediate consensus. . . . As institutions (and textbooks) move closer to teaching with other discursive means (video and web writing, but what else?) we'll see the consensus [of form and function, medium and message, writing and composing].

Imagine, for instance, digital video as "writing." Another contributor to this thread, Lee Honeycutt, a professor at Iowa State University who uses digital video to teach writing for the Web and other Tech/Comm courses, points out how various technologies like digital video are used in the workplace to share information and how they go beyond theoretical distinctions. Honeycutt (2002) wrote, "I think this technology has the potential to transcend those distinctions and will be incorporated by many different [educational] programs in the future. Text is just one form of virtual reality, as are video, 3D computer animation, and hard-core goggles VR, and all are being used today to model abstractions and express ideas." In practice, however, it is not easy to teach composing with three-dimensional computer animation, virtual reality goggles, or even digital video.

English (2002), for instance, related how he teaches document composing with digital video. He found that teaching both medium and message, while focusing on how technologies and communication modes influence readers and writers using multimedia, is becoming imperative. He wrote in this online discussion:

> The evening on which an assignment was due, I welcomed anyone who wanted to share their digivid with the class to do that on the projected computer, and I asked us to discuss the work with the class—their process, decisions they made, tools, techniques, tricks, problems, etc. . . . It was there we had a chance to talk about musical choices and how music influenced us as authors; fades and transitions and how those techniques made meaning and connected concepts from video clip to image to text; choice of footage; etc. Because all projects were situated within a rhetorical situation, we were able to talk about the immediate and real rhetorical dynamics going on and how the author used the technological tools to achieve her goals. So, for ex-

> ample, key questions we asked included, who's the audience? What's the purpose? Whose voice does the author represent? ... Immediate reflection and "thinking about" the technology and rhetoric, as well as a reflective piece of scholarship at the end of the course, gave my students immediate and ongoing motivation to think rhetorically, both individually and as a full class.

For English, "As soon as I got into it, I saw that the expository and persuasive composing my students were doing was just as important as the technical composing, and that digivid created a pretty amazing composing and communicating environment for all of it." Although creating an entire course that uses digital video as the primary composing medium would admittedly be technically challenging, a good place to begin would be considering how technologies and attributes of communication modes can be illuminated through existing assignments.

PATTERNS OF BEHAVIORS IN COMMUNICATION MODES

The history of communication and technology can be systematized into five categories with overlapping behaviors: the spoken word, the written word, the printed word, the electronic word, and the virtual word. For instance, Ong (1982) laid out what he saw as the progression of media and rhetoric, beginning with primary orality—those cultures in which orality is the only medium for words. The oral medium is characterized by evanescence: Content relies on the accuracy and longevity of memory. Different tools can be used to aid memory, primarily manipulating the "unique characteristics" of the delivery of sound. "Loudness, quality, pitch, and duration directly influence the intensity of [the] perception" of activity, of presence, of power that can be conveyed by sound (Chesebro & Bertelsen, 1996, p. 85). Yet, these researchers noted, "We have little reliable evidence regarding how valuable the content of verbal communication is in oral cultures" (p. 86), noting the findings of Burgoon, Buller, and Woodall (1989) that "only 35–40 percent of meaning is conveyed through the verbal mode" (p. 87). Such findings more than suggest we should examine the influence of other nonverbal means of communicating: touch, eye contact, smell, spatial manipulation, body movements, and the use of time, objects, and the "hue, brightness, and saturation of light" as well as the use of the voice (Chesebro & Bertelsen, 1996, pp. 87–90).

Ong (1982) pointed out that literacy using these tools, as well as communicating itself, becomes "interiorized" and is difficult to recognize as a technology (pp. 81–82). Still, as Bolter and Grusin (1999) suggested that "Literacy is, among other things, the realization that language can have a visual as well as an aural dimension, that one's words can be recorded and shown to others who are not present, perhaps not even alive, at the time of the recording" (p. 16).

The written word necessarily separates content from its deliverer, however, placing words on the page. In other words, writing creates a storage place for "what is known outside the mind" (Ong, 1982, p. 79). Whereas the oral is the medium of the tribe, the written word is the medium of the individual; literate societies have different characteristics than oral societies. According to Ong, a literate society makes use of more complex, sustained arguments. The literate society is more logical, for instance, and is much more concerned with intellectual property rights. Writing is generally given more authority than an oral statement. The printed word is the medium of hierarchy, in part because written text is traditionally read in two-dimensional space and has an inherent structural value: The top is more important than bottom. Thus, according to Purvis (1998), the physical nature of the written word potentially limits our ability to conceptualize by conditioning us to think hierarchically.

Print culture is concerned with the commodification of language. Mass production of books affects print culture's interest in the accumulation of knowledge. The printed word, however, because of commodification, lends itself to mediation, remediation, and hypermediation. Bolter and Grusin (1999) discussed these terms in *Remediation: Understanding New Media.* In a review of this book, Blakesley (2001) summarized these terms succinctly. According to Blakesley, mediation is "the representation of an object, a formative interface whereby the object of contemplation is structured and presented by some intervening medium." Writing, therefore, is a mediation of thought process or memory. Remediation takes place when more sophisticated technologies like computers refashion other forms of media, like writing, print, and painting (Bolter & Grusin, 1999, p. 60). McLuhan (1964) warned us about the impact of the medium being the message, however, and the danger of transparent technologies. He suggested that "the personal and social consequences of any medium—that is, of any extension of ourselves—result from the new scale that is introduced into our affairs by each extension of ourselves, or by any new technology" (p. 23). In other words, when new media tools are introduced to deliver content, some form of commodification takes place. The medium negates the creation and delivery and reception of the content. Technical communication students must be taught this principle.

Lanham (1993) explored the impact of transparent technologies further. According to Lanham, the more interactive audience that makes up an oral culture has returned in today's society. That is, written and print cultures are relatively passive, but electronic cultures are interactive in ways similar to oral cultures. Ong labeled this interactivity "secondary orality," a stage in our development of the "technologizing of the word" wherein electronic tools re-shape and reuse tools from oral, written, and print cultures. Lanham suggested that "as readers, we have to learn to alternate between these two kinds of syntax, verbal and visual. [And] if we add to this binary expansion the sound and color rapidly becoming part of the mix, we can envision how rhetorical practice will literalize all its metaphors" (p. 77). But, when the message involves sharing meaning and de-constructing the medium as well, remediation is hypermediated, a "style of visual representation whose goal is to remind the viewer of the medium" (Bolter & Grusin, 1999, p. 272).

Why is it important for technical communicators to know characteristics of oral, written, print, and electronic cultures? Why should we teach mediation, remediation, and hypermediation? Our virtual culture takes secondary orality and the interactive age one step further. Our society is the medium of the virtual tribe. We have ready access to very diverse subcultures through computer technology, for instance. In fact, the invention of computer communication and the rapid growth of the Internet has changed the landscape of communication completely. As Kress (1998) pointed out, there is a new focus on visual literacy, different modes of representation can be easily combined, and the convergence of various technologies (like the telephone, television, radio, and computer) requires technological literacy as well as an understanding of many different cultures (pp. 53–79). For Mary Hocks (2003), rather than being the "radical rupture" with the past, new media really extend the hybridity of word and image that runs through "all written and visual communication systems back to classical rhetoric" (p. 4). It is clear that media and rhetoric, inextricably bound together, powerfully affect both the nature and the transmission of knowledge in any given culture. The medium we use to communicate shapes our rhetoric, by affecting how we communicate, and rhetoric governs the development of media. We must rethink assignments to embrace the multiple modes of communication that are used—synchronously—every day. The medium and the message are the message.

RETHINKING ASSIGNMENT OBJECTIVES

Assignments in technical communication courses generally include one or more of the five components of the communication process: There is a sender, a message, a purpose for sending the message, some means for sending the message, and a receiver. The goal is to configure objectives that correspond to attributes of each communication mode using different media types. Teachers might ask students to create a resume or letter of application, for instance, and to consider how a resume or letter can embrace both the interactional nature of oral and electronic cultures as well as the sequential preference of literature cultures. Students could analyze and evaluate the differences in resumes presented over the phone, in print, online, as hypertext, in some combination of these modes, and so on.

Chesebro and Bertelsen (1996) presented a table comparing patterns of behaviors for communication technologies (p. 166). In general, the data structure of an oral culture is holistic, whereas in a literate culture structure is discrete. How might knowing this fact about various audiences change how technical communicators design an informational brochure, create a description of a piece of equipment or a process, or compose an instructional handout or a collection of short correspondences or a team proposal? Chesebro and Bertelsen pointed out that in an oral culture, the quantity of information that can be delivered is high and the process is very active or immediate. With a literate culture, an overload of information can be offered, but information is often delayed. And electronic cultures value relatively low levels of information and more passive learning approaches. How does understanding these behavior patterns inform the objectives that might appear in an assignment on creating a website, developing technical training plans, or generating a professional portfolio? Different audiences for which technical communicators process information value each communication mode in some way.

In general, the skills involved in graphic design, in imaging, and in video or audio composition are usually taught in discrete units, if not in different disciplines or departments. For most students, throughout most of their education, technical communication is thus reduced to the process (and all too often only the product) of writing, rather than the complete experience of composing. The reality, of course, is that the composing and presenting of content are inseparable, not two acts, but one. Wiley (2003) notes that research in cognitive psychology suggests that "to the extent that information can be coded redundantly (that is, both verbal and visual form) we are more likely to remember that information" (p. 205). More explicitly, by compartmentalizing assignments, we restrict students to the medium of academic tradition (the printed text), whereas we should be training them to compose in the prominent delivery mode of their present (digital multimedia). We are continually bombarded by multimedia, and freeing students to explore multiple modes of composition and communication enables them to understand more integrated, advanced processes. Thus, teachers must look at composing communication holistically, recognizing the value in integrating various modes, resisting the inclination to privilege the written. We believe that contemporary students already possess significant skills in "reading" and understanding various literacies, including the photographic, the videographic, the iconic, the gestural, and the aural. We further believe that these students can tap into and combine literacies just as readily as, and perhaps even more readily than, they learn to process the purely textual. Teachers should explore the fascinating imbrications of contemporary media, for example, exploring ways in which the graphical cannot be separated from the textual (D. McQuade & C. McQuade, 2000).

We have approached the teaching of both technical communication and regular composition from this perspective, guided always by questions such as the following:

- How do different discourse communities communicate?
- What are some of the underlying messages contained in the media we use or read?

- How does an acute visual awareness alter one's words *as one speaks them*?
- Which words need not be written when a visually descriptive photograph is present?
- How is learning to sequence multiple media or various technologies learning to compose, to communicate?

Such an approach does not abandon or even abate the teaching of verbal, textual communication. Rather, we emphasize enhancing such instruction with other compositional modes. In such a course, students would study communication technologies and examine human response to oral culture, chirographic composing strategies, typographic writing, electronic culture, and virtual words, while composing artifacts to meet specific assignment requirements. Each medium, each mode of communication, entails its own literacy; these resultant multiple literacies reflect the changing nature of meaning consistently altered by the contexts in which they occur—contexts composed of and altered by the presence of other media. Simply put, meaning can no longer be made effectively if we limit ourselves to written language; meaning requires completion via the visual or aural. In a world composed of/by multiple media, textual meaning is created/altered by image; the meaning of image is altered/extended by text and context. Our students, therefore, will need to be equipped with the skills to gather, shape, and deliver information in a variety of communicative modes for an increasingly complex world of multiple media. We cannot continue teaching the communicative strategies of the recent past or even the present when our students need to learn how to wield the literacies of their future.

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15

Integrating the Web into an Introductory Technical Communication Course

Susan Lang
Texas Tech University

Technical communication service courses are already being pushed to the limit on nearly all fronts. As Nagelhout (1999) noted, these courses may be the only experience that students have with writing after first-year composition. For students who have started their academic careers at community colleges or have tested out of first-year composition, the technical communication service course might be the only writing course taken at the university from which they graduate. This fact alone puts an increasing burden on the faculty and graduate assistants who commonly teach this course—suddenly they become accountable for a student's ability or inability to write to professional standards.

Additionally, a quick examination of current textbooks used in the service course illustrates that the core of what instructors believe that a student needs to understand in order to write professionally has changed, and continues to do so. In addition to the "basic rhetorical skills" ("basic" being a gross misnomer) and knowledge of the conventions of common workplace genres, which provide a sort of baseline competency measurement, students now engage such topics as usability, digital environments, visual rhetoric, information management and design, and collaboration.

Pedagogical and assessment options are also multiplying; some instructors advocate portfolio assessment (Coppola, 1999; Scott & Plumb, 1999), whereas others look toward situated or service learning to provide a solid grounding in communication skills (Artemeva et al., 1999; Blakeslee, 2001; Breuch & Kastman, 2001; David & Kienzler, 1999; Matthews & Zimmerman, 1999; McEachern, 2001).

Finally, the fact that these courses often provide a training ground for the graduate assistant instructors should not be forgotten. Teaching the service course represents the initial technical writing teaching experience for most doctoral students; although the challenges vary from teaching the first-year writing course (where many graduate students begin their teaching careers), it soon becomes apparent to the graduate instructors that such courses in technical communication contain, via their increasing complexity, their own intricate set of pitfalls and traps. These novice instructors are often faced with questions such as: What is the proper ratio of teaching technological tools versus teaching writing in the service course? How does one deal with a class populated by a variety of majors, and students from first-year level to graduating seniors? Such issues pose significant problems for experienced instructors, let alone for those beginning their teaching careers.

Although the pressures described are by no means comprehensive, they remind readers that making any change to the service course curriculum is not unlike playing Jenga®—the game where one begins to build a tower with wooden pieces and then continues to try and construct more levels of the tower by taking previously placed pieces from the lower levels and using them to assemble additional floors. As this collection of essays demonstrates, technical communication instructors at all levels are seeking effective ways of integrating study of the World Wide Web into their courses. For the already overtaxed service course, an added Web component might indeed seem the piece that brings down the Jenga® tower. The project discussed in this chapter attempts a metaphorically similar operation in that it considers one option for integrating the World Wide Web into a technical communication service course, an option that strives to take into account all of the elements that are already so precariously balanced, and to add this new element in a way that does not bring the entire curriculum crashing around the instructor and students alike. The chapter first considers what the Web might bring to a course and describes one example of how the Web has been incorporated into a service course curriculum. Next, it will consider what can be gained and lost by modifying the curriculum in the manner described. Finally, it will offer recommendations to instructors who wish to try similar initiatives in their classrooms.

WHAT CAN THE WEB BRING TO A SERVICE COURSE?

Much of the attention given to the Web in technical communication scholarship has focused on the role of the Web as an instructional delivery medium for distance courses in technical communication, from undergraduate courses to graduate seminars (Duin, 1998; Gillette, 1999; Leonard, 1999; O'Sullivan, 1999; Schneider & Germann, 1999) and on repurposing face-to-face courses for the online environment (Jorn et al., 1996). One exception to these general discussions is Kramer and Bernhardt (1999), which examined the types of learning taking place on the Web.

Much less work has been published in terms of examining how the Web can be used productively in a course without it being relegated to ancillary status, and overshadowing the remainder of the course assignments and materials. Adding a web-centered element would inevitably seem to push something out of the picture, particularly in an introductory service course that already attempts to cover a variety of reports, instruction sets or manuals, and workplace correspondence. Yet, as Shirk (1997) pointed out, technical communicators now assume a variety of roles beyond the writing and editing of texts—roles of user interface expert, product designer, information architect, customer trainer, process facilitator, media selection consultant, interpersonal communication advisor, and usability specialist (pp. 361–366). All of these roles demand that students hone their interpretive and analytical skills along with their writing skills, yet it can be difficult to provide students with the real-world examples required to help them reach any level of proficiency without also requiring them to attain a level of content expertise seldom held at the sophomore or junior level. Regardless of whether the service course exists to recruit new majors, provide a foundation for new majors, or provide a service in the form of teaching professional writing skills to a group of nonmajors, it needs to address the expanding role of the Web in technical communication—a role certain to include considerations of web design and team responsibility. Thus, using the Web as subject for discussion and analysis in the service course will serve several goals. First, it will allow students to continue working with conventional print-based genres while introducing them to the rhetorical and design strategies used to create websites. It will also require them to critically analyze and interpret both print-based and electronic documents. The additional content that students will need in order to complete writing tasks will be largely rhetorical and design oriented, rather than a random topic that appears to apply tangentially to the field of technical communication.

ENGL 2311 AND THE WEBSITE REDESIGN PROJECT

ENGL 2311, our service course, meets twice weekly in a computer classroom. Students in ENGL 2311 range from second-semester first-year students to graduating seniors, which makes it essential that some common ground be established in terms of writing practice, rhetorical theory, and instructor expectations because many students are a year or more removed from their last writing course. The first month of class is devoted to reviewing rhetorical concepts that students may or may not recall from their earlier writing courses. Assignments are brief and include composing a resume, revising the letters and memos of others to gain practice in rhetorical analysis and in editing, and writing an instruction set. Although students collaborate on portions of each of these first projects, mainly in the critiquing and editing stages, they work predominantly alone. I also take this time to evaluate students' experience level with writing, computers, and the World Wide Web.

The website redesign project begins approximately 5 weeks into the semester. Having a sense of the median experience level of the group aids me in introducing the redesign project. For example, if the majority of the students are juniors and seniors in computer science and business or marketing, many of them will be able to make connections between their other coursework and the redesign project. However, if students are predominantly sophomores who work in fashion design, for example, I will introduce the project as one that more heavily stresses writing and design rather than technical coding. Regardless of the class profile, I have found that students who may have little experience with web design or technical communication are more comfortable with the idea of redesigning an existing site than building a new one, because they have an initial artifact to analyze, respond to, and rebuild.

Week 1: Beginning the Project

Students will be working in groups for the duration of the project, so at the beginning of the fifth week of class, prior to beginning the actual redesign project, we spend a day discussing and writing about the dynamics of group work. Students are asked to begin class by writing a short memo in which they detail their past group experiences—when they worked in groups, whether it be for an academic project, on a summer job, or as part of a sports team; what their group's project, or goals, entailed; and what they had learned about working in groups as a result of these experiences. The purpose of this discussion is to raise student awareness of the benefits and problems that can occur when working in groups, to recognize problematic scenarios before they become detrimental to group progress, and to think about how they themselves usually interact in a group setting.

The following day, the project itself is introduced. The overview handout distributed to all students includes the following information (my comments are interspersed between sections):

Website Redesign Project

For the next seven weeks, you will be working on the group project for this course: The Website Redesign Project. There are seven components to this assignment (Rhetorical and Design Analysis of the Site, Proposal, Team Assessment Memo, Progress Report, Group Presentations, Redesign Sample, Completion Report) that will be detailed below.

This project is collaborative; project teams will consist of 3–4 people. Groups will self-select; you have worked informally with a number of your colleagues over the last month, so you have an idea of how working styles differ and whom you might work well with. Once you have chosen your team members, your first task will be to give your project team a name.

These first, brief paragraphs give students an overview of the project. Many students have never worked on a single academic project over a sustained period of time and find themselves overwhelmed by the idea of a 7-week task. For that reason, only the first component of the project is discussed in the remainder of this handout. We talk about the others in class, but I defer handing out the remaining assignment descriptions for a few days until students begin to settle in to the project cycle. One frequent question I receive from students at this stage deals with whether their work will be submitted to the actual client. I do not require students to find a client to work with "live" for logical reasons. First, Lubbock, Texas, is a relatively small town of 200,000. Each class has enough students to form at least four and usually five groups; thus, if only my own two classes complete this project, we need to find 10 websites each semester to redesign; if other instructors adopt this approach, then the number of groups could quickly multiply. Over a few years, finding local clients who would be willing to work with the students could be difficult and/or time consuming for instructors, many of whom are doctoral students in technical communication and taking a full load of coursework as well as teaching. Further, remember that the 2,311 students are often redesigning their first website in this class and writing proposals and reports for the first time. Although it seems an obvious and appropriate choice to ask students nearing the end of their program to engage in a real project for a real client, doing so with novice web designers often ups the stakes on such an assignment to the point that much of the writing is sacrificed in favor of trying to complete a design that will please the client. A challenge for instructors is to remind students that the ultimate focus of this redesign is the writing they do about the project rather than the site redesign in and of itself. Thus, students are indeed welcome to submit their work to the owners of the websites they have chosen to redesign, but they are under no pressure to do so.

The next concern for most students involves grading, and I try to handle immediate questions in the next segment of the handout on evaluation:

Evaluation of Projects:

Each component of the project carries a specific weight that is listed on the syllabus and will be evaluated based on the criteria listed on the individual assignment sheets. You will refer to those as you work on each stage.

Except for the Assessment Memo, all components are collaborative projects. This means that each group will submit one document for each of the six components. Each group will receive one grade for each of the six components. In contrast, each student will be assessed individually for the Team Assessment Memo. Additionally, a participation grade will be levied for the entire project, and will be determined based on both in-class participation and assessment of efforts by your peers.

NOTE: If any group member is absent for the duration of time in which a component is assigned, then he or she will receive no credit for that assignment.

Following this, students receive the assignment description for the first part of the cycle, the choice of the site and the design/rhetorical analysis:

Week One: Choosing a Website for Redesign and Completing a Design and Rhetorical Analysis

In the first portion of this project, each group will 1) choose a website to redesign, and 2) write a rhetorical and a design analysis of the site. All sites will be approved by the instructor before you begin work on the rhetorical/design analysis.

In your initial choice of site, consider the following: It must be sponsored by a business or non-profit organization whose purpose is to inform or persuade its intended audience about a specific topic or product. In addition, the site must consist of multiple pages, unless the sponsor has chosen to place all of its material onto a single page.

Bear in mind that most websites consists of several (if not countless) pages. You are only required to redesign a small portion (8–12 pages) of the chosen site. The pages you choose to redesign should be informed by your increasing knowledge of technical communication and rhetoric, which means you should choose pages that do not meet the needs of their audience and will, therefore, benefit the most from your redesign efforts.

Once you have chosen a site, your first task is to perform an analysis of the site in which you compose a rhetorical/design analysis in the form of memo to me. This memo will be a minimum of 6 pages and will need to include screen shots of the site as well as your written analysis. Over the next week, we will discuss rhetorical and design considerations for websites and how these resemble or differ from those we have discussed for printed documents.

In your analysis, you will:

- apply concepts discussed by Nielsen and others to your chosen website as a basis for critique;
- discuss what you believe the purpose of the site is
- discuss who you believe the intended audience(s) of the site to be;
- discuss the strengths and weaknesses of the site organization and navigation, individual page layout, and site content;
- make recommendations for improving/expanding the site.

Also keep in mind the following:

Rhetorical analysis requires you to break the site into parts and then explain the strategies used by a designer to persuade, inform, or entertain one or more audiences. Individual pages seem like logical divisions, but you'll need to analyze the component parts of a page as well to be successful.

You'll examine components in terms of common rhetorical appeals: *ethos, pathos, and logos.* Successful designers will invoke all of these in the creation of a site; less successful sites will neglect one or more.

This first assignment builds directly on the rhetorical analyses that students have written for earlier assignments. Students are given a short excerpt (pp. 166–214 and pp. 380–390) from Nielsen (2000) that is discussed, along with a set of design guidelines, in the next class at the beginning of Week 6. Although Nielsen does not necessarily represent the last word on site design, his work is a useful starting point for many reasons: It is accessible for students and the emphasis on simplicity and user-centeredness reinforces many of the concepts we have been discussing to this point in the course. It also is reassuring news for those students who have never thought about site design and who are convinced they must include cutting edge technology to create a successful website.

After we discuss the assignment, students move into their groups and begin talking about possible sites to use in this project. If they have not finished a list of two or three possibilities to submit to the instructor by the end of class, then they must do so for homework.

Week 2: The Rhetorical/Design Analysis

The first item of business at the beginning of this week is to finalize the selection of redesign sites for each group. Following this, class discussion and activities on this first day of the week are devoted to discussion of Nielsen and of what it means to analyze a website for rhetorical and design elements. We examine a number of sample sites and consider how an analysis of the site would be structured and what components that structure might include. Students have about 20 minutes at the end of discussion to break into their groups and work on the analysis. They are required to come to the next class with an outline of their analysis.

In the second class of the week, they workshop the analysis. The instructor serves as a facilitator for much of this class by responding to questions or concerns from each group. Homework for this class includes finishing a complete draft of the analysis and reading a textbook chapter on proposals.

Week 3: Proposal

When students return to class this week, they spend a short time sharing their analyses with another group. We then meet as a class to discuss the second component of the project, a proposal addressed to the owner of the site that recommends a redesign. Once again, students only submit these proposals to me for evaluation and feedback on the effectiveness of the rhetorical elements of the document rather than to a client.

Guidelines for the proposal include the following:

- explain to the entity in charge of the site the problem(s) with the existing website; the root of such problems/needs may be rhetorical in nature, or they may result from design and/or navigation issues;

- define and explain fully the audience(s) and purpose(s) of the proposed redesign;
- explain how your proposed redesign will address the particular problems you have discussed, and what the additional benefits of the site will entail;
- discuss a plan of work for completing the site, which will include a schedule for completing the work, a tentative site diagram, and tentative page layout schematic for the site

Like any report, the proposal will include an introduction and conclusion. In terms of length, expect the proposal to be a minimum of six pages (single-spaced, of course). It may include screen shots if you plan to redesign an existing site or can create mock-ups for the new site.

Students will thus use their rhetorical analyses to build a case in their proposal for redesigning the site.

Following the discussion, students will move into their groups and spend the remainder of the class working on various components of the proposal. Once again, they will meet with the instructor as needed to ask specific questions about content or presentation of their work.

The second class of the week is devoted entirely to workshopping the proposal. For homework, in addition to finishing the document, students review a basic guide to HTML website such as Annabella's Hypertext Hints for assistance in understanding the essential elements of HTML coding.

Week 4: Coding and Design

Class begins, again, with a short debriefing regarding the proposal. Entire groups pair off to engage in a peer critiquing of what they did to produce the proposal and the problems they encountered.

Following this, we begin a brief overview of HTML. I emphasize the word "brief" to underscore the fact that one danger at this point in the project is that students and instructors can become sidetracked by coding concerns. I cannot stress enough the need for instructors to remind students that the coding is a means to an end—providing a more user-centered website—and not the end in itself (as in "hey, I can make an image bounce across the screen five times in a row"—but for what purpose?). During this discussion, we examine code from sample sites, as well as write some basic code and view the results, all the while talking about the importance of coding with a rhetorical or a design goal in mind. Students understand that all elements of the site are subject to redesign—text, graphical elements such as banners, logos, buttons and other visuals, and overall structure and navigation. Students who want to work more in-depth with graphics have access to PhotoShop, PaintShop Pro, and Microsoft Image Composer on the classroom computers. They also have access to a scanner.

Note that because of this "coding for a purpose" approach, I have found it more productive to have students code rather than use a web publishing application. I have experimented with having students use FrontPage, DreamWeaver, and other authoring applications, but find that new coders are often overwhelmed by these applications, so we often revert to working in source view anyway. However, a full discussion of the question of whether or not to teach code or applications is beyond the scope of this text.

A salient question, however, is whether students should be required to actually code the site redesign or create a mock-up in another format. Initially when designing this project, I chose to ask students to actually write code for their redesign. However, as the make-up of the class changes in some semesters to a less technologically adept group of students, I offer the option of creating a mock-up of the site in order to keep the students from becoming too distracted by the coding process and to ensure that all group members take an active role in the redesign process. In several cases, when it becomes clear that few, if any, students had experience with coding, I strongly recommend that they work in a medium in which all group members can contribute, whether that be paper, Microsoft Word, or some other application.

The remainder of that class, then, and of the entire week is devoted to design and coding. Quick evaluation of the proposals is essential, as students will use these as a blueprint for their work. At this point, teachers must also consider the deliverables they will request from their students each day that is devoted to coding. I find that asking for a specific number of pages or components of pages ensures that groups do not fall behind. It should be noted that students will not upload these to a public server when completed; instead, they will submit their redesign for evaluation using paper, disk, or CD-ROM, according to their preference.

Week 5: Assessment Memos and Progress Reports

As hard as it is for students to believe, they are at the midpoint of the project. By the beginning of this week, they should be well into the coding of the site. Most of the first class in Week 5 is devoted to coding matters (note that creating 8 to 10 pages on a site is not difficult when all group members are involved; those who want to rely on a single student will now be feeling the pressure to catch up). Toward the end of class, however, we discuss the next two elements of the project—assessment memos and progress reports.

These documents ask students to make another shift in audience. Their rhetorical analysis was written to me (their supervisor) and the proposal was addressed to the client. Both the progress report and assessment memo will be written to me, their supervisor, and we spend some time in class considering what types of information will be presented in each document. We also discuss the occasionally delicate issue of providing a fair, yet accurate evaluation of their colleagues via a team assessment memo in which they discuss and evaluate the contributions of each group member. The assignment descriptions for each document follow:

Team Assessment Memo

Rhetorical Situation: Assume for the purposes of this memo that your website redesign team has an immediate supervisor, who has asked you to evaluate your team's performance and to make suggestions for improving team performance in this memo. Address this memo to your supervisor (me) and consider the following as you draft:

- Use a professional, reader-oriented tone regardless of whether the information you provide is positive or negative
- Address each individual's relationship to the group and to the web project. A good assessment memo will address each individual group member's contribution to the Proposal Report and will provide a detailed description of the group's working relationships
- Assess the author's contribution to the group and to the progress of the Rhetorical Analysis, Proposal, and Coding of the site thus far.

Consider the following traits in your evaluation of each group member:

- Dependability
- Cooperation
- Effort
- Quality of Work
- Attendance at Meetings
- Meeting Deadlines

Progress Report

Definition/Purpose Statement: A progress report discusses work you have started but not yet completed. Usually, these reports are submitted at regular intervals and may cover one project or all projects being worked on by an individual at that time. They may be directed at internal (within the company) readers or to external clients.

Elements of the Writing Situation: Although progress reports talk about the past (i.e. the work you have done thus far), they are used to make decisions about the future. If you write the reports to your superiors, they may use the information to aid in managing the project (doing what they can to make the project go smoothly or to get in back on track). They may also use the report to help them manage other projects related to yours. In contrast, clients will want to know what the results are of your preliminary work and your timeline for completing the work. They will also want information related to budget—are you within budget, over, or under to this point.

Structural Elements/Format of the Report: The report is presented in memo format and contains some or all of the following elements, organized as appropriate for the audience:

- Introduction: You will always explain the work period this report covers (i.e. the work done on the Electronic Goldmine project from March 2–29). You may explain the purpose or provide other background information if the reader is not very familiar with the project.
- Facts and Discussion: You should always explain whether or not the work is progressing as you and your client expected, summarize your results, and forecast your progress until the next reporting period. Be sure to compare your actual progress with that which was proposed in the original plan of work. If there are significant differences, explain them and the reasons for the differences. Provide enough information to inform your readers, but do not include every specific triumph or setback of the project. The easiest way to organize the report is around time periods—what has happened, followed by what will happen. Be sure to emphasize important findings or problems and treat them with enough detail to satisfy your readers' needs and desires for information.
- Conclusion: Your conclusion contains your overall views on the progress of your work. If the report is brief, it may also contain any recommendations you might have for improving the project, overcoming some past or anticipated difficulty, or refocusing or altering your project. In a longer report, these recommendations would merit a section of their own.

Tone: Your goal in all progress reports is to persuade your readers that you are doing a good job, especially if you are working with a new client and you think the work might be discontinued if you do not show satisfactory progress. This does not mean that you adopt an inflated or highly optimistic tone, one that would make your report sound more like advertising copy than a professional communication. Such a tone might make your reader suspicious or set you and your team up for a fall should your final product not live up to the lofty expectations you set. Remember, your credibility with both internal and external readers is on the line.

The second day of class this week is devoted to working on progress reports, assessment memos, and, occasionally, coding. Instructors must be willing to shift gears quickly as student needs require. Students will finish the progress report and the assessment memo by the first class meeting of the following week.

Week 6: Preparing Presentations and Finishing the Coding

Students debrief in groups about the progress reports, before coming together as a class to discuss the next component of the project, the presentation to the client. Again, success on this component is contingent on having students understand both the objective of the presentation (to show off their work and gain audience feedback) and the audience (the client who has requested the redesign—individual audience members may or may not be familiar with the project). Groups will incorporate PowerPoint and a short script into a 10- to 15-minute presentation of their work. Guidelines present the following elements:

- A brief discussion of the primary need driving the redesign
- A brief description of the audience(s)/purpose(s) of the site you are working on, which helps focus the presentation
- A discussion (and this comprises the focus of the presentation) of the design decisions you have made in the redesign
- A question-and-answer session

We follow this discussion of specifications with a brief introduction to PowerPoint. Many of these students are already familiar with the application; thus, we spend time discussing effective uses of the application in the context of the presentation's purpose and audience—in short, we consider the rhetoric of a presentation.

Students will spend the remainder of class time this week building their presentations and (usually) putting finishing touches on their redesign. The role of the instructor remains the same—that of a facilitator.

Week 7: Presentations and the Completion Report

During this week, students present their work. Following the first day's presentations, we discuss the final component of the project, the Completion Report to the supervisor. This report serves as a final accounting of their work; students recount and assess the project, provide a final assessment of accountability of each team member's effort, and leave the supervisor with suggestions and/or recommendations for future interaction with this particular client. The assignment description follows:

Completion Reports

Definition/Purpose Statement: Completion reports may take many different forms. They may report on research conducted in the field or laboratory (research reports), or they may analyze and interpret information and recommend a particular option or course of action (feasibility or recommendation reports).

Elements of the Writing Situation: Often, the best way to determine reader expectations, which will then help you make choices about your report's purpose, tone, and structure, is to talk to those who will read your report or to the person who asked you to write it. If you do not have access to those people, consider the following questions as you prepare to write:

- What do you want readers to know, do, or learn from the report?
- Do you want to document or describe a situation or a problem?
- Do you want to present or evaluate possible solutions or options? Or, do you want to recommend a particular solution or option?

Keep in mind that regardless of the specific purpose of a report, your goal is to provide your readers with information they can use in some professional or practical way. For example, your supervisor may need to explain or justify design decisions to the client, and your report should enable her to do so.

In this case, your completion report will analyze all facets of the website redesign project and be written to me as your supervisor. It will report on the events that occurred since the progress report, including the actual redesign of the site and the oral presentation.

Structural Elements/Format of the Report: Your report will, in format, look much like your progress report. It will discuss the work you completed since the progress report, describe the reception of the site by your usability testers, and the reception of the oral presentation. It will also discuss any future plans or work (such as periodic updates of the site) that you have contracted with the client to provide.

Tone: The tone of the report will again be professional without sounding overly optimistic or triumphant that the task is complete. Your goal is to sound like a competent professional unit. You will, of course, use sentence structure and word choice in ways that facilitate the easy reading of the report.

Students draft and revise this assignment outside of class, and turn it in along with their redesigned pages when they come to class the following week, 8 weeks after the project cycle began.

CONCLUSIONS AND RECOMMENDATIONS

Over the past 2 years, students have worked with a variety of websites. Successful redesigns include those of a minor league baseball team, several local and regional radio stations, local restaurants, an electronics supply company, and a business school website.

Readers should note that these successfully redesigned sites generally share the following characteristics—they are small in terms of page numbers and have fairly specific purposes. Less successful redesigns occur when students pick large, commercial sites or sites that consist of a single page. The former are overwhelming, whereas the latter usually do not provide enough material for students to work with. It is imperative that instructors take the time to examine any website proposed as a redesign project and discuss its redesign feasibility during the time when students are beginning work on the rhetorical analysis of the site. Short conferences with students at this time will go a long way toward getting them off to a successful start with the project.

The redesign project does present challenges for instructors; however, the project is one that can be modified based on the instructor's own experience with group work, technical communication pedagogy, or website design and redesign. For example, I would not recommend that the redesign be assigned as an individual project unless students can be flexible in their choice of media. New instructors should make their participation expectations clear at the beginning of the project and include a brief discussion of what group members should do if they find that any group members are not doing their part to advance the project. Group size should also be limited to three or four students so that students recognize the need to actively participate in all aspects of the project. For instructors less comfortable with web design, it might be advisable for them to select a dozen or so Web sites for students to choose from as subjects for redesign so that instructors can familiarize themselves with the sites in advance.

Regardless of what individual modifications an instructor makes, including such a project as this in the service course will result in some changes. The following list is by no means exhaustive, but is provided to give readers a sense of some of the trade-offs. Whether the following are gains or losses is up to the individual instructor to determine. But these represent the substantial changes we saw in the service course once we incorporated the Web Redesign project:

- A gain in student autonomy in that students work with the instructor as facilitator once the project begins; instructors gain management experience—rather than teaching daily, they may hold brief meetings at the beginning of class before students break into their groups and work in periodic consultation with the instructor.
- A greater focus on document generation as subject as well as practice within the course
- A critical understanding of a rapidly evolving medium: the Web.
- A simulated project sequence of 8 weeks, which gives students a sense of a project cycle, rather than isolated and decontextualized composition of documents, yet without the logistic difficulties that often arise with service learning projects
- An opportunity to work in a sustained collaborative environment and to work through the personnel issues that occasionally arise

The previous items represent the changes from the instructor's perspective. Any significant change in curriculum should also take into consideration the reactions of the students to the project. Obviously, they have little basis for comparison other than the word of mouth that follows every course, but they can certainly assess whether or not the project challenged them (in terms of subject matter, coding and writing, extended time commitments to a particular group, interpersonal dynamics, etc.) or taught them valuable information about critique and analysis of print and electronic texts, writing, coding, presenting, working in presentation and web design, or group dynamics, to name just a few.

After students turn in the completion report and the final redesign, they write a brief memo in which they are asked to comment on the project in terms of teamwork, various types of activities associated with the project, and about the role of rhetoric in the project. More specifically, students are asked to discuss what, if anything, they learned about the following:

- About teamwork, group dynamics, themselves as team players (very important in today's corporate environment), and the amount of work in a collaborative project?
- About the activities involved in redesigning the website
- About persuasive and/or sales writing in your proposal
- About objectively and honestly assessing team members and project progress as well
- About synthesizing and putting it all together in the presentation
- About the labor of actually redesigning the site itself
- About rhetoric as a result of this website redesign project. Think about such things as audience, purpose, and construction of documents and projects to meet the needs of audiences and clients.

A few representative comments from the students indicate a generally positive reaction to the project. One individual, in discussing collaboration, noted that "group work is generally a lot of work, especially if group members do not plan ahead before they meet. However, had I done the project alone, it probably would have taken twice as long. Looking back, the most successful and productive meetings were those that involved prior preparation and goal setting."

Students remark at length about the features of individual writing assignments. One student said, in discussing the proposal:

> A key to persuading the client in the proposal was explaining how changes to the web site would be beneficial. Keeping a positive tone was a major area our group focused on in the proposal. Instead of criticizing and pointing out problem spots, we focused on how we could enhance the good things already on the site. Furthermore, we stressed how enhancements to the site would help popularize and spread interest in Disneyland vacations.

Another considered the only solo assignment during the project, the team assessment memo, and wrote:

> I enjoyed writing the team assessment memo because it provided me an opportunity to reflect on the work each member had contributed. The memo helped me realize what a valuable asset each member was and what great work each had produced. After reflecting on my team's work, I felt that I had worked hard, too. I am proud of my

> contributions and have a better attitude about group work and seeking help in my writing. I discovered that it is okay to rely on others and ask for assistance.

Other students reviewed the presentation process. One individual wrote:

> The presentation of your work is another important aspect of a project. This is the time in which you have the opportunity to not just tell the client in words what you have accomplished, but also show the client what you have done. I learned that it is important not to make your presentation to flashy. The most important aspect of the communication is the interaction between yourself and the client. Visual aids are a great aid in a presentation, but they should not be used a substitute for personal interaction.

Finally, in summing up the project as a whole, one student offered the following:

> I must admit I did not think this class would be as hard or detailed as it has been. I am actually amazed at the amount and intensity of knowledge that I have attained this semester through projects like the website redesign. I know that skills attained in this as well as other projects in technical writing will eventually enhance my future success in professional fields.

For most students, then, the website redesign project serves to introduce them to a wide variety of technical communication activities. Moreover, it also shows them that regardless of the seemingly disparate nature of the assignments, they can be accomplished via the application of some basic, common principles of technical writing. They do not exit the course as expert writers, web designers, or collaborators; rather, the project enables them to get a taste of all of these. The project is, in itself, an intellectual manifestation of the Jenga® game for both instructor and students, challenging them without adding so much in a single turn that one topples the tower.

Thus, the incorporation of this project offers rewards in addition to the practice of writing skills. Given the proliferation of web-based, data-driven interfaces in many fields of work, it is likely that students will encounter, regardless of their major, some aspect of web-based communication. Often we tend to ignore the more visual media such as the Web, perhaps because we assume that because our students have been raised in a media-saturated world, they have achieved some level of competency or literacy in analyzing such material. Although they may well have acquired tacit knowledge of the Web, many do not have the same working understanding of the vocabulary and technique needed to conduct a formal analysis of it. This project enables them to engage in analytical activities that then must be translated into writing in professional genres. Finally, then, the assignment leaves them with an increased knowledge of the ways in which we use the Web in conjunction with other means of professional communication. This seems a fitting service for the service course to perform.

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16

Writing for the Electronic Medium: A Course for the Times

Mary F. O'Sullivan
Western Wisconsin Technical College

The 2-year college is often overlooked in discussions of technical communication curriculum and pedagogy, primarily because it is still uncommon for a 2-year college to have a degree program in technical communication. In addition, 2-year colleges have historically prepared students for further education at 4-year colleges or granted terminal associate degrees, so the institutions were not perceived as supporting a mission that would include more than a course or two in technical communication. However, 2-year programs may become more common as students treat the boundaries between institutions of higher education as more fluid in these days when the physical geography of campuses matters less than access to electronic offerings.

Until recently, Western Wisconsin Technical College (Western) offered only two courses in technical communication: one course in technical writing and one in organizational communication. The rapid changes of the past decade, which have seen computers become the tools of choice for composition, and networks—particularly the Internet—become the medium of choice for publication, have necessitated that colleges review curricula as well as methods of instruction for writing classes. Such curricular and instructional change is of particular importance for the teaching of technical writing, as many types of technical writing (e.g., manuals, documentation, etc.) have migrated to electronic versions, often available only on the Web. Those realities led to the creation of two additional courses at Western, which in turn became part of a certificate program in technical communication offered by the Communication Skills Department at Western, emphasizing the influence of the electronic medium on technical writing. In 2001, additional courses supported the creation of a 2-year technical communication degree. (Curriculum for both the certificate and program available at http://www.wwtc.edu/techcomm/) One of the new courses developed was called Writing for the Electronic Medium, which I teach totally online at http://learn.wwtc.edu/mfo This chapter describes that course, situating it within the larger context of the rapidly evolving world of technology and the Internet, while exploring issues specific to the 2-year college setting. In addition, this chapter describes the design for the Writing for the Electronic Medium course, provides a rationale for offering the course only in an online environment, examines the course content, and argues for the importance of the Web site in the class. It is a virtual classroom as well as an example of technical writing, embodying the connection between text, design, and the electronic medium.

TWO-YEAR COLLEGE MISSION AND STUDENTS

Two-year colleges are in the unique position of serving students on multiple paths. There are students who enroll, attend for 2 years, earn a degree, and become employed in their field. There are also students using the 2-year college as a stepping-stone to enrolling in a 4-year college or university. There are students with 4-year degrees attending with the goal of taking specific courses, or completing 2-year degrees, to complement their bachelor's degree. Finally, there are students employed and on a career path that requires additional education, who take single classes or work on entire degrees. A brief history will illustrate how the 2-year college came to be a crossroads to many futures.

There is no typical 2-year or community college. But, there is general agreement that the mission of the community college is to be an open-access institution that prepares students for advanced study; to offer career education, guidance, developmental education, and general education; and to provide community service (Cohen, 1992; Lombardi, in Cohen, 1992; Medskar & Tillery, 1971). These institutions were conceived of as postsecondary education for the masses, an opportunity to learn particular skills or information, and a uniquely American experiment in education: "nontraditional institutions for nontraditional students" (McGrath & Spear, 1991, p. 11). Open access and free or very inexpensive tuition made them attractive to those who could not afford, or were not prepared for, elite colleges, and they seemed to be a path of upward social mobility.

Public community colleges began at the turn of this century, often as part of local school districts, governed by the school board. They were primarily transfer-oriented institutions, offering lower division college courses. Some people originally thought that the availability of such "junior colleges" might mean that 4-year colleges would give up their lower division courses. But significant events radically changed the mission of the community colleges: World War II ended with large numbers of veterans eligible for the GI Bill, and the Truman Commission reported that half of all young people would benefit from attending grades 13 and 14 (Cohen, 1992). These two events resulted in the first surge of growth for community colleges. The second growth surge in the 1960s resulted from an influx of federal dollars to vocational education, changing the focus from "junior college" with emphasis on transfer, to "comprehensive community college" with a dual role of vocational preparation and transfer in most states.

When the Truman Commission on Higher Education completed its recommendations concerning community colleges, there were slightly over 497,000 students enrolled in such institutions, public and private, in the country (Commission on the Future of Community Colleges, 1988, p. vii). By 1960, public community colleges alone numbered 400, with an enrollment of more than three quarters of a million students (Commission on the Future of Community Colleges, 1988, p. 5). By 1988, there were over 1,200 accredited community, junior, and technical colleges, with an enrollment of over 5 million students. According to the National Center for Education Statistics' (NCES) website, as of 1997, the most recent date for which numbers are available, there were 1,664 2-year colleges enrolling over 5.5 million students, and these colleges accounted for 50% of the freshman enrollment in postsecondary institutions. The NCES projects that enrollment at 2-year colleges will reach 6.3 million by the year 2011, an 18% increase. According to statistics from the American Association of Community Colleges' National Community College Fast Fact website page (May 2004), community college students constituted 44% of the total enrollment of U.S. undergraduates in 2000. It is clear that enrollment in 2-year colleges is not slowing down, and it can, therefore, be assumed that 2-year colleges are filling a need that includes the evolution of courses and degrees.

Western followed a pattern of growth similar to that already outlined, and the college's student demographics match those from other 2-year colleges. For example, during the 2001–2002 school year, the average age for all full-time students was 24, the average age for part-time students was 35, and the average age for all enrolled students was 33. Nearly one third of all credit students were over 30. Recently, Western has begun to experience an interesting phenomenon, with an increase in enrollment from the ranks of those who have been previously enrolled at 4-year institutions and those who have bachelor's degrees. For 2002, nearly 3% of enrolled credit students had 16 years of education, nearly 4% had more than 16 years of education, and nearly 21% had more than 12 years of education.

In summary, on the average, students at 2-year colleges are older than those at 4-year institutions. And this older student body means that nearly all students work as well as attend college classes, many times working full time. The older average age also means that many students not only are juggling college classes and work, but also commitments to families and often children. For example, everyone in the fall 2002 Writing for Electronic Medium course had jobs (many full-time) and many had children. As one of those students said in her self-introduction to the rest of the class: "I'm Jeanne, a speech pathologist who is working towards a Technical Communication degree. Like many of you, I'm attempting to compress 48–72 hours of work into one day and still look perky in the morning!"

TECHNICAL COMMUNICATION IN A 2-YEAR COLLEGE

Western is one of three, 2-year colleges in Wisconsin to offer an associate's degree in technical communication. The first college to offer such a degree is a sister institution in the Wisconsin Technical College System. That program is, however, designed around short modules rather than more traditional courses, and is marketed heavily to those already employed who may be searching for a course providing specific skills rather than for a degree. The third college was in the process of implementing their program in fall 2002.

Historically, technical communication at 2-year colleges is not much discussed in the literature of the field, and there seems to be some contradiction in sources providing numbers of those institutions offering a degree. For example, Pickett and Angelo (1986) found that many 2-year colleges were offering a course or two, but only 23 were offering either an associate's degree, a certificate, or both. Currently, the Society of Technical Communicators (STC) website lists 64, 2-year or certificate programs in technical communication. Of those, 9 are located at colleges outside the United States. Germany and Austria each have 1 listing. Canada has 6 listings; however, all but one are housed at universities as short-term programs. Of the 51 U.S. schools with 2-year or certificate programs of study listed, 1 is a high school, and 18 are housed at 4-year colleges or universities. Only 31 of the listings are housed at 2-year colleges. The Association of Teachers of Technical Writing (ATTW) has only 1 listing for a 2-year college degree in technical communication: Western. These numbers seem to indicate that there has been some growth in the number of technical degree programs offered at 2-year colleges in the United States, but not a surge of such programs.

Technical communication degree programs are created in 2-year colleges with the same attention to fitting the curriculum to the institutional mission and personality that happens in a 4-year college. In addition, however, 2-year colleges must encourage a close dialogue with local business and industry, and encourage involvement with the process of development (Mehaffy & Warloe, 1989). Western sought this involvement from local employers from the outset. For example, at several focus groups that occurred in 2000 as part of the planning process for the degree, local employers made it clear both that they would like employees to enroll in the degree program and they did not want the work week interrupted. To meet those needs, all the courses in the technical communication program are offered in alternative delivery venues, including online, through Interactive television courses, in the evening, and in accelerated format. These alternative formats, and particularly online delivery, have become and will continue to be increasingly important to technical communication programs. (See, e.g., the special issue of *Technical Communication Quarterly*, winter, 1999 concerning online learning.)

One other reality affecting the development of technical communication programs is the evolution of the job title. A quick look at employment advertisements shows first that there are few jobs simply for technical writers; most job descriptions refer to "technical communicators." As the use of the computer, word processing packages, desktop publishing software, databases, and spreadsheets have become standard tools of the workplace, those who do technical writing also find themselves designing the layout, creating graphics, inserting pictures and images, and preparing the entire copy-ready document. No longer do other specialists complete those jobs while the technical writer concentrates on writing text. Instead, most technical communicators find themselves responsible for all components of the document. In addition, technical communicators are expected to be familiar with writing for an online environment and with HTML. Technical writing students, then, must learn the skills of writing for a hypermedia environment (see, e.g., Grice & Ridgway, 1995; Norton, Segaard, & Duin, 1997; VanHoosier-Carey, 1997). As the skill sets of technical communicators become more entangled with various technologies, additional questions arise that influence curricular and pedagogical decisions (see, e.g., Breuch, 2002, and Selting, 2002). It is clear that there will continue to be dialogue about the place of these technologies both as instruments and as areas of study. It is also clear that these technologies will increasingly become a part of technical communication students' lives and work.

Pickett (1990) found that over 80% of the technical communication courses at 2-year colleges were located in English departments, and most faculty teaching technical communications had English majors (79% at the undergraduate level, 84% at the masters level, and 97% at the doctoral level), whereas 11% had graduate majors in technical writing. One item of particular note in Pickett's study is that 38% of the full-time teachers and 59% of the part-time teachers had experience as technical writers. The Wisconsin Technical College System (WTCS) requires faculty to have work experience in the field within which they teach. Thus, a higher percentage of technical communication faculty in the WTCS have been employed as technical writers. So, of the five faculty teaching in Western's technical communication program, three have been employed as technical writers. One, who teaches the technical editing course, has no technical writing background, but has been the defacto department grammarian, teaching grammar and editing classes for over 20 years. As the fifth faculty member, I started the path to electronic technical communication instruction independently: had my first e-mail account in 1989, began using GOPHER and Veronica for research, vividly remember the first mention of the World Wide Web on MBU,[1] downloaded and installed a copy of the first version of Netscape when it became available free to edu-

[1]MBU, Mega Byte University, was one of the first e-mail-based discussion lists for those interested in the emerging field of computers and writing.

cators, and created my first instructional website by hand coding the HTML. In other words, I became a teacher and writer of technical communication, and particularly online technical communication, based on research and a latent technical nerdism.

THE *WRITING FOR THE ELECTRONIC MEDIUM* COURSE

Relation to Other Courses

It may be argued that none of the discussion of text and technology demands that the skills and concepts of writing for an online venue should be housed in a separate course. Those rhetorical elements could become part of a first-year writing course, and have in many instances (see, e.g., Sidler, 1999). Other writing courses taught in our department, most notably our first-year composition course, the Technical Report Writing course, and Professional Business Writing, have evolved to contain discussion of the rhetorical elements of electronic text. For example, most instructors teaching the first-year course include work with online searches and discussion of the way websites are set up as well as heuristics for evaluating websites for credibility and validity. There is not, however, time for in-depth experience with the differences between print documents and the capabilities of e-text that a webbed environment not only provides, but also demands. Web writing requires an awareness of form, format, and the conversation between text and graphics that Western students do not have until after they have completed a technical writing class, where those elements are stressed much more so than in a our first-year writing course. One other factor affecting the content of the course is that it precedes a course focused entirely on writing online documentation. There is, therefore, no attention to documentation in the Writing for the Electronic Medium course.

Online Design Considerations. A number of factors influenced the implementation of the course, from its inception, as a totally online course. Some, such as the student demographics and suggestions of local business and industry, were discussed in preceding sections. In addition, however, the realities of the increasing influence of the Internet on writing and instruction, form part of the impetus for course design. One point of reference for how the Web is used in instruction is Green's annual survey of college computing. In 2001, according to Green, 71.5% of all college students owned computers, up from 58% in 2000. Green's 2000 survey shows that from 1995 to 2000 use of e-mail, web resources, and course web pages had at least tripled. In addition, the National Center for Educational Statistics (May 2002) reports that 2-year college students take more distance education classes than those at other colleges, and 60% of those distance education classes are offered online. Offering Writing for the Electronic

Medium solely online not only provides students with constant interaction with the world of e-writing, but also literally makes it possible for some students to take courses and participate in the degree program who would not otherwise have been able to do so.

The entire website is native HTML independent of platform or a particular piece of software. The course website reflects my belief that standard course creation software forces instruction into the mold created by an instructional designer rather than allowing the course to reflect an instructor's pedagogical position. (For a more extensive discussion of the constraints of courseware, see O'Sullivan, 1999.) The course site has all the information and tools a student needs to be successful in the course, including links to college resources and other resources online. (Appendix A is a copy of the print letter and class website tour sent to all online students prior to the beginning of the semester. It offers a detailed account of the resources available to students.) The website is customizable and makes use of several additional programs to provide specific types of communication for students and instructor. In other words, the course website itself is a model of web writing as well as the site of our virtual classroom.

The course is also heavily informed by my overall pedagogical philosophy and the experiences I have had teaching online since 1997. Those experiences have led me to subscribe to specific terminology to describe the multiple levels on which the Internet and Web may be used for instruction. Each has a valid place in the panoply of tools used for instruction, but it is important to be clear about the distinctions between those levels if one is to understand what a fully online class entails. Sechrest (1998) and Shave (1998) both referred to a four-level hierarchy for instructional sites, providing a useful language from which to begin a discussion that distinguishes between levels of involvement for both instructor and student. These levels of hierarchy are informational, supplemental, dependent, and fully online.

Informational and supplemental websites provide useful information for students in a traditional face-to-face classroom environment, but do not require students to use the course website to be successful in the class. A dependent course website has material or activities that the students must work with if they are to be successful in the class, but again, the class itself is conducted in a traditional face-to-face classroom. A fully online class provides everything the student needs to be a part of the class and learn without face-to-face meetings. It is independent of place, but should not be independent of schedule or carried out in isolation. Some interesting discussions in trade journals recently have addressed the efficacy of the type of independent, step-by-step learning, which in the 1960s was referred to as programmed learning, clearly showing its roots in the early computer industry. For example, Barbian (2002) touted the benefits of "blended learning." Barbian defined blended learning as adding communication tools to static self-paced content, whereas other common definitions of the term refer to a blending of face-to-face meetings and online instruction. In an online trade journal, Gottfredson

(2002) argued that business would realize a higher return on their e-learning investment if it were led by instructors. It is clear that there are still some difficulties with varying terminology to describe technology-supported instruction; however, I contend there is no real online instruction without an instructor and a great deal of communication among the instructor and the students.

The heart and soul of online instruction is communication. Of course, a well designed online course must be based on sound principles of pedagogy informing the design of activities and assignments that will actively involve students in their learning, and that will encourage them to accept responsibility for their learning. The more students are actively involved in constructing their learning, the more effectively they learn. In addition, however, the art of teaching is manifested in the ways that faculty strive to construct an atmosphere in their classrooms that is conducive to learning and that reflects their own individual experiences and personalities. Good teachers sculpt a class. They mold a disparate group of people into a class, learning and working together. When they are successful, students and teachers benefit and learn together.

Ideally, that is what happens in a face-to-face classroom. Ideally, that is exactly what happens in an online classroom as well. Just as a successful teacher in a face-to-face classroom must understand what methods work best to involve students in the endeavor of learning, so too must the online teacher. So, for example, one of the most effective ways to involve students in their own learning is to encourage collaboration among students, to create work groups for class projects. This very same technique works equally well online. And, just as a successful face-to-face classroom teacher works to create the camaraderie that turns a group of individuals into a class, cooperating in the work of learning, so too does a successful online instructor do the same. It is for this reason that self-paced, correspondence-type structures for online courses are not nearly as successful as those that follow a regular semester schedule exactly like the schedules that students in face-to-face classes follow. Students cannot collaborate or feel part of a real class if they are simply working individually and not interacting with one another.

In a traditional face-to-face class, students and instructors communicate in a number of ways: lectures, handouts, Socratic discussion during class time, and face-to-face conversations in the instructor's office or in the halls of the college. My objective when designing online classes is to incorporate the benefits of all of these means of communication into the class. To ensure student success in online courses, teachers must not only design activities that work to help students learn in an online environment, which is the science or the pedagogy of instruction, they must also pay attention to the artistry of teaching. The art of teaching online is predicated on skillful use of all the communication tools available. In fact, successful online instruction means that the teacher is as involved with her online students as she is with her face-to-face students, that she knows them as well, and that she communicates with all students at least several times each week. I believe it is crucial to encourage communication between students and instructor, as well as among students in the course. Initially, I tried to reproduce all those ways of communicating using only e-mail. I discovered that students had great difficulty separating the types of messages (i.e., assignments, text lectures, questions, and discussion of issues surrounding assignments or the class). I now use the following multiple tools:

- For one-to-one communication, the kind that would take place face-to-face in an instructor's office, I use e-mail. This means that students may e-mail me directly with concerns or questions specific to the work they are doing, and I reply directly to them.
- In addition, however, I use an e-mail-based discussion list that I call eWrite. eWrite allows me to send messages to all the students enrolled in the class, without having to set up a distribution list in my e-mail. Students subscribe to eWrite and I use it all semester as a means of helping students pace themselves and as a prompt to keep them on track. It is also available for students to ask questions about assignments. When they send e-mail to eWrite, everyone else in the class sees the message, and they all see my response to it. So e-mail serves as a venue for asynchronous office hours, for disseminating material that might occur in a lecture, and for questions of procedure and content.
- A conference is employed to offer a space for reflective discussion of the course material, readings, and issues raised by those readings. Discussion questions are posted weekly on issues that parallel course content being studied. Students are required to compose an answer offline and to copy and paste their answer into the conference. They then read what others in the class have posted and respond. In other words, the conference is the locus of class discussion. In addition, the software used, WebBoard, has a chat function that allows for online office hours in real time.

The effective online course is not simply content. Rather, it creates the same personality that happens in a traditional face-to-face class via frequent contact, discussion, and interaction. The difference is simply that in the traditional class, this is accomplished orally and in the online class, it happens through text. As one of my students in the fall 2002 Writing for Electronic Medium class said: "The online resources are good, but the class interaction connects me to real people."

As is true with all instructional strategies, both those employed in a traditional classroom and those in an online classroom, the design emerges from specific learning goals and objectives (Pitt & Clark, 1997). Sammons (1998) noted that there are five levels of material students must learn in an online writing course: technical skills, knowledge of Web concepts and terminology, writing skills, hypertext skills, and skills in design and graphics. All of those areas are addressed in Writing for the Electronic Medium, with more emphasis on the conceptual skills and less emphasis on the technical. Technical skills are acquired through practice and exposure to possibilities, but conceptual skills grow from active involvement with the course material. The online learning environment is ideally suited for active learning (Chickering & Ehrmann, 1997) and students in Writing for the Electronic Medium actively engage the material of the course; they actually produce what they read about and discuss. Finally, as Walker (2002) pointed out, website design and writing takes place in the "contact zone" (Pratt, 1991) of the intersection of the academic instructional world and the professional world of the Internet. Students learn in the academic world, but literally publish in the professional world.

COURSE PROJECTS

The course objectives (see Appendix B) are experienced through five projects and nearly weekly discussion in the class conference. The projects were chosen to allow the student to experience the diversity of writing in terms of standard rhetorical considerations of audience, purpose, and format. Rather than focusing solely on writing for websites, the course includes exploration and production of documents in the wider arena of the Internet, including e-mail, e-mail-based discussion lists, newsgroups/blogs, conferences, and whiteboards. In addition, the projects delve into ethical considerations, and time is spent on the important underpinnings of organization for web writing.

Project 1: E-mail

E-mail has become fundamental to internal and external communication of organizations. It is fast replacing the phone for some types of communication. Printed memos and meeting minutes and business letters are disappearing, to be replaced by e-mail documents sent through institutional and corporate local area networks (LANs), wide area networks (WANs), or the Internet. The course begins with an exploration of netiquette. Netiquette refers to etiquette on the Internet. In other words, it describes behavior commonly considered to be appropriate for e-mail-based discussion lists, individual e-mail, and newsgroups. The study of netiquette goes beyond considerations of politeness, however, and includes serious ethical issues and privacy issues. In addition, e-mail communication and formatting conventions, as well as the psychology of e-mail, are explored. Not only will the lessons learned in this section help students in their personal life and all areas of their professional life, but it also sets the expectations for all e-mail communication throughout the semester between student and instructor as well as among students. The end product for assessment of this project consists of a properly formatted e-mail created by each student, following conventions for professional communication, that summarizes what the student has learned. In addition, students post to a usually lively conference discussion on these topics.

Project 2: E-mail-based Discussion Lists

Building on the fundamentals of e-mail, the second project works with one of the most ubiquitous means of online communication other than instant messaging and chats. The latter, instant messaging and chats, are generally used for casual conversation rather than technical communication; so, although they are common, they are not addressed in this class. E-mail-based discussion lists, on the other hand, occupy useful positions in professional and organizational communication. Students first search for e-mail-based discussion lists concerned with a focus they have previously chosen for the class.[2] They then subscribe to at least two; this serves as insurance in case one list is not active. They collect messages over the course of several weeks, analyzing them to create a portrait of the list studied. In addition, they spend time discussing the lists' welcome messages with their classmates in the class conference, paying attention to content, but also discussing the constraints of the list server software. For assessment in this unit, students then construct their own individual welcome messages for hypothetical e-mail-based discussion lists of their own that reflect what they have learned of content and format.

Project 3: Ethics

The topic of ethics is an underlying element of all the projects. Issues such as ownership and copyright are the focus, but not exclusively. Students look at copyright not only in terms of text ownership, but also address ownership of code, images, sounds, and so on. One of the weekly discussion questions asks them to explore issues of free speech and privacy. Students apply what they learn through the reading and discussion to write a policy statement for their website, explaining how they, as site creators, observe copyright and intellectual property rules. This eventually becomes part of a page for their site where they list sources for material, images, or code used.

Project 4: Newsgroups, Conferences, Blogs, Whiteboards, and MOOs

Those who are relatively new to the online world often believe that the Web is the Internet, and have no sense of the roots of the Internet, no awareness of how the

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[2]Students are asked to choose one of four foci: personal/hobby, business, medical/technical, or creative writing. They then build each assignment around their interests and/or field, and the website is designed with separate resource sub-websites for each.

underlying Internet impinges on the more familiar world of the Web reached by easy-to-use browsers. So, one purpose of this project is to encourage students to explore the history of the Internet through their readings, and to sample a newsgroup or two. In addition to e-mail, newsgroups were the basis of communication on the early Internet. Although newsgroups still exist, many of their functions are being replaced by conferences and newer technologies such as Blogs. For example, one early function of newsgroups was to provide a place where participants could discuss technical issues and problems with hardware and software. Currently, the first stop for much technical support is a forum or conference on the website of a company producing the hardware or software, where users post questions and technicians post answers. Project 4 is designed to allow students to experience several of these environments, and to design writing for these environments. So, students experience WebBoard as part of the class, but also explore TappedIn, Blogger, and QuickTopic, which provide free whiteboards and/or forums/conferences.

The first time Writing for the Electronic Medium was offered, it included some experience with MOOs. In recent years, however, this component of the project was eliminated due, primarily, to time constraints. In addition, however, few MOOs are used in business and industry. Rather, whiteboards are used extensively in business for presentations and to create spaces where a document might be shared and edited by multiple people.

Project 5: Web Writing

Web writing is the most complex project for the course. Students design website structure, write content, and create the website. The social context of sites is emphasized, as students read about website design topics, but also spend time researching model websites in their focus area and evaluating them. They write formal proposals for individual websites, including a description of the project, a discussion of its purpose and the audience to whom the website is directed, and a discussion of the origin of the content material. The second step of the project requires students to create a flowchart illustrating site navigation and hierarchies, followed by the creation of a template page illustrating the layout and color scheme for pages on the site. Finally, students put into practice what they learn from reading, exploring, and class discussion as they write content pages.

The final component of this project requires students to view and review each other's work. The websites are mounted on either the class website or on one of several sites that allow free, small website space, or on other servers to which students have access. Students begin the last class discussion with a post reflecting on their experience. I ask them to do the following:

> Write an overview for your classmates telling them the following:

1. What were you trying to accomplish with your website? In other words, what purpose does it serve or what need does it fill?
2. Who is the audience for your website?
3. What considerations went into choosing the design for the site?
4. What do you think is most successful on your site?
5. What do you think you would change?

CONCLUSIONS

New technologies require users to learn new ways of thinking, and they sometimes metamorphose into functions diverse from the original. For example, Alexander Graham Bell, a devotee of classical music, originally thought his telephone would be used as an instrument to bring symphonic music to towns across the United States. He never envisioned a world with a telephone in every household, let alone a telephone in everyone's pocket, backpack, or purse. We are fast approaching a time in the Western world where there will be one phone per person, and that phone will be a combination cell phone, PDA, and functional small computer. Similarly, in these yet early days of the Internet and Web, students arrive in colleges having experienced parts of the Internet and Web, but seldom with any knowledge of the literacies needed to write in that environment. There will come a time, however, when a course such as Writing for the Electronic Medium may not be necessary. Just as students no longer need instruction in the basic use of MS Word and most other office software, there will come a time when the principles of writing for the electronic medium will simply be subsumed into all writing and technical communication instruction. Standard college writing classes will work with a range of writing, print-based and e-text. Students coming to college will have been writing e-text since grade school. Until that time arrives, however, there is a place for a course such as Writing for the Electronic Medium in a technical communication degree offered in a 2-year college, a 4-year college, or a university.

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APPENDIX A: WEBSITE INTRODUCTION

1. Enter your class site by going to: http://learn.wwtc.edu/mfo. Once there, click on the stars and then choose Writing for the Electronic Medium from the menu. You may also access this page from the WWTC Virtual College site at: http://learn.wwtc.edu. This site is the site that automatically comes up when using IE in the computer supported classrooms. It is linked from the ACL page that is the first page you see if you use IE in the Academic Computing Lab. If you use a computer at home, I recommend that you add the class site to your favorites or bookmarks.

2. Read the material on the front page for your class site. Notice that you can get to other WWTC sites, and that my office, office hours, and email address are all on this page.

3. Begin your tour by clicking on About eWrite. This section of the class site explains materials you will need for the course, course requirements and grading policies. You will need these for reference all semester.

4. Under Communication, you will find an explanation of all the communication tools we will use in the class and directions for subscribing and registering. In addition, there are links to the class email page where you will find email links for all your classmates, and a link to our WebBoard conference.

5. Next choose Resources. There are two options here. One leads to a number of important resources we will be using all through the semester and is titled Web Resources. Make sure you explore these resources! Academic Resources leads to WWTC's Online Writing Center and other writing resources.

6. Click on Assignments. The first option provides links to the 4 focus areas you will use for your assignments. Feel free to explore them. I will send more information out on how you will use them, through E-Write when the semester begins. The second option leads to the projects for the semester. Each has instructions and worksheets for all your assignments. You need to have a user id and password for this section. They are: id = mfouser and password = projects. Some of the links on this page will take you to rtf files that will open in your word processor and allow you to type directly on them. (Note: If you access these from off campus, AFTER you enter the user name and id, you will get an additional dialogue box asking for a user name and id. Simply click CANCEL and the correct document will appear.)

7. The Course Outline option will lead you to an interactive, week-by-week outline of everything that will happen in the course or to a printable course out-

line. All the reading and writing assignments for each week of the semester are available on the online outline.

APPENDIX B: WRITING FOR THE ELECTRONIC MEDIUM COURSE OBJECTIVES

- Analyze the key issues concerning internet ethics.
- Analyze the communication medium's affect on text construction.
- Design electronic text that meets content, purpose, and readership needs.
- Construct efficient maps for online text.
- Construct efficient file structure for online documents.
- Demonstrate proper netiquette.
- Evaluate the interaction between online communities and text construction for those communities.
- Evaluate the functions of specific types of webpages in relationship to an entire website.
- Design electronic text and webpages that include the standard textual components needed on webpages.
- Create web-text that meets accessibility needs of those with physical disabilities.
- Write electronic documents that reflect the constraints and utilize the advantages of a variety of electronic media.
- Utilize graphic design to enhance text in online environments

Contributors

John F. Barber teaches in the Interactive Arts and Technology Program at the University of Texas at Dallas, exploring the convergence of the humanities, science, and technology. His research and publications often address new media and how they might facilitate teaching, learning, and communication. A current project is the Brautigan Bibliography Plus+ (www.brautigan. net/brautigan/), an interactive website providing multimedia bibliographic information, and much more, for writer, Richard Brautigan, while experimenting with ergonomic rhetorical interfaces and functional written and visual rhetoric in virtual spaces engendered by new media.

Saul Carliner is an assistant professor in the Education Department at Concordia University in Montreal, Canada. His research interests include models for designing workplace content and metrics used to assess the effectiveness of this content. Among his publications are *Designing E-Learning*, *An Overview of Online Learning*, and *Techniques for Technical Communicators*. He has received two Best of Show Awards in the Frank R. Smith Outstanding Article Competition. A fellow and past international president of the Society for Technical Communication, Carliner holds a PhD in instructional technology from Georgia State University.

Michael Day is an associate professor of English at Northern Illinois University, where he directs the first-year composition program and teaches composition pedagogy, technical writing, and writing for electronic media. Day is a former chair of the NCTE Assembly on Computers in English, and current chair of the

CCCC Committee on Computers in Composition and Communication. He has presented and published widely on topics ranging from intercultural rhetoric to internet communication and teaching.

Laura Gurak is professor and head of the Department of Rhetoric, Program in Scientific and Technical Communication at the University of Minnesota. She has authored two books with Yale University Press: *Cyberliteracy* (2001) and *Persuasion and Privacy in Cyberspace* (1997). In addition, she has coedited two volumes, one on research methods for Greenwood Press (2002), and one entitled *Body Talk* for the University of Wisconsin Press (2000). Laura is also director of the University of Minnesota's Internet Studies Center and a faculty fellow of the University of Minnesota Law School.

Gil Harootunian is an assistant professor in the School of Education at Syracuse University. She is a former Fulbright senior lecturer and researcher, and current U.S. project director of a U.S. Bureau of Educational and Cultural Affairs Freedom Support grant for a 3-year exchange project between Syracuse University and Yerevan State Linguistic University, Armenia (formerly a Soviet republic). She is particularly interested in the ways in which creating a writing culture can help to strengthen democracy in new nations like Armenia. Gil has coedited *Fractured Feminisms: Rhetoric, Context, and Contestation* (SUNY Press, 2003), and edited *The Personal Narrative: Writing Ourselves as Teachers and Scholars* (Calendar Islands Press, 1999; 2nd ed., Parlor Press, 2004). Her current research centers on the connections between writing-intensive instruction and democratic methods of governance.

William Hart-Davidson is an assistant professor of technical communication in the Department of Writing, Rhetoric, and American Cultures at Michigan State University. His research and teaching bridge technical communication and IT, with a particular emphasis on the design of technologies that support literate activity.

TyAnna K. Herrington's background in law contributes to her interest in intellectual property issues, although her specialization in rhetoric and technical communication drives her ideological inquiry. Herrington's books treat issues in law: *Controlling Voices: Intellectual Property, Humanistic Studies, and the Internet* (SIU Press, 2001) examines the digital influence on ideological conflict in intellectual property law, and *A Legal Primer for Technical Communicators, Multimedia Developers, Graphic Designers, and other Creative Communicators* (Longman, 2003) provides explanations of the legal problems that beginning creative developers are likely to encounter. Although many of her publications treat issues in intellectual property, the first amendment, and the work-for-hire doctrine, she has also published articles treating ethics and document design.

Lee Honeycutt is an associate professor in the English department at Iowa State, teaching courses in web design, digital pre-press techniques, and the critique of communication media. His research focuses on the dynamics of composition technologies, including e-mail, voice recognition, and digital video.

Johndan Johnson-Eilola works as the director of the Eastman Kodak Center for Excellence in Communications and associate professor of technical communications at Clarkson University, managing a university-wide communication education complex and teaching courses in information architecture, technical communication, and usability. He is the author of *Nostalgic Angels: Rearticulating Hypertext Writing* (Ablex/Greenwood), as well as the web-based textbook *Professional Writing Online* (Longman, with J. E. Porter and P. Sullivan) and the print textbook *Designing Effective Websites* (Houghton Mifflin). He has also guest edited special journal issues on intellectual property (for *Computers and Composition*, with L. Gurak) and computer documentation (for *Journal of Business and Technical Communication*, with S. Selber), as well as numerous book chapters and journal articles. He is currently completing work on *Datacloud: A New Theory of Online Work* (Hampton Press), *Central Works: Landmark Essays in Technical Communication* (Oxford University Press, with S. Selber) and *Opening > Writing > New Media: Theory and Applications for Extending the Teaching of Writing* (Utah State University Press).

Susan Lang is an associate professor of English at Texas Tech University, where she serves as codirector of the first-year writing program. She is a codeveloper of Texas Tech's Interactive Composition Online ((ICON), and teaches courses in technical communication and rhetoric. Recent publications have appeared in *Computers and Composition* and in *College English.*

Carol Lipson is director and chair of the Writing Program at Syracuse University. In 2002, she was elected as a fellow of the Association of Teachers of Technical Writing. She has published on the history and theory of technical communication, on ancient medical writing, and on ancient rhetoric more generally. With Roberta Binkley, she edited a collection entitled, *Rhetoric Before and Beyond the Greeks* (SUNY Press, 2004).

John Logie is an assistant professor in the Rhetoric Department of the University of Minnesota, where he teaches courses in science writing, scientific and technical communication, and rhetorical theory. He is known for his work addressing intellectual property and authorship in a variety of contexts, stretching from ancient Athens to the World Wide Web. He is currently working on a booklength project on the rhetoric surrounding Napster and related peer-to-peer file-transfer technologies. He is also currently co-chair of the Conference on College Composition's Intellectual Property Caucus, where he works to influence public policy and ensure maximal public access to creative work.

Susan Loudermilk is an associate professor of English at Texas A&M University–Corpus Christi, where she coordinates the technical and professional writing program. She also serves as a director in the Title V program at the university. Her scholarship focuses on technical writing, writing pedagogy, writing and technology, literacy, and service learning. She has published articles and review essays in *Business Communication Quarterly, Technical Communication Quarterly, Academic Exchange Quarterly,* and *Language Learning Across the Disciplines.*

Karen McGrane directs the information architecture and usability area at Razorfish, defining the practice and overseeing the work of information architects, user researchers, and usability specialists. She also leads the user-centered design process on client projects, constructing taxonomies and navigation systems, designing user interfaces, and conducting user research and usability tests.

Mary O'Sullivan is a technical communication instructor at Western Wisconsin Technical College. She has degrees in English and creative writing, as well as a PhD from the University of Wisconsin–Madison. In addition to teaching face-to-face writing classes in computer-supported classrooms, Mary teaches four classes online each year at http://learn.wwtc.edu/mfo. She serves as a consultant and provider of instruction for her colleagues concerning online instruction. She has taught at a number of 4-year colleges, and worked in public libraries and at a hospital library at the Mayo Clinic. The focus of her research and writing is the world of electronic text and writing for the Web.

Carole Clark Papper is associate professor of rhetoric and composition at Ball State University where she serves as director of the writing program, teaching graduate and undergraduate courses in composition, rhetoric, research, and multimodal composition. For the last 7 years, she has focused her efforts on administration, securing over $1 million in grants for the English department's writing, computers, and literacy initiative and for faculty development in teaching with technology. She has published in *Kairos: A Journal of Rhetoric, Technology, and Pedagogy*; *Self & Text: A Bulletin of Research and Applications*; and *OCTELA: The English Language Arts Bulletin.*

Jim Porter is director of rhetoric and writing at Michigan State University, where he is helping to develop new graduate and undergraduate programs in rhetoric, writing, and professional/technical writing. He has been awarded the 2001 Braddock Prize for best article in *CCC*, the best book award (by *Computers and Writing*) for *Rhetorical Ethics and Internetworked Writing*, and together with Patricia Sullivan was twice awarded the NCTE Technical Communication prize for best article on theory/philosophy as well as the best book award for *Opening Spaces: Writing Technologies and Critical Research Practices.*

George Pullman is associate professor in the English department at Georgia State University, where he teaches the full range of courses in writing from freshman composition to graduate seminars in the history of rhetoric. He has published articles in *JAC, Rhetoric Review, Rhetoric Society Quarterly*, and *Computers and Writing*. He is also online editor for *JAC*. His most recent work involves the development of electronic portfolio software and of a blog program.

Rich Rice is assistant professor of English at Texas Tech University, where he serves as associate director of the writing program. His primary areas of interest include portfolio assessment, new media studies, networked writing environments, and teacher training. A reader he has developed, *Writing for Life: Making Sense in the Real World*, is forthcoming from Longman.

Michael J. Salvo, formerly assistant professor at Northeastern University, is now assistant professor at Purdue. He is currently investigating information architecture as a site for technical communication research. His research interests are in cultural studies of technology, user-centered design, computer-mediated communication, and instructional technology. His work has appeared in *Technical Communication Quarterly* and other technical writing journals, *Computers and Composition*, as well as in *Kairos* and other online publications. Salvo is a founding member of *Kairos*, a web-based peer-reviewed journal that continues to publish hypertext scholarship in rhetoric, technology, and pedagogy. He holds a PhD in technical communication and rhetoric from Texas Tech University.

Stuart Selber is an assistant professor of English at Penn State, where he also holds a faculty position in distance education in the World Campus. His research on computers and technical communication has won awards from the National Council of Teachers of English (two times) and Computers and Composition. His book, *Multiliteracies for a Digital Age*, is under contract with Southern Illinois University Press.

Kirk St. Amant is an assistant professor with the Department of English at Texas Tech University. With a background in anthropology, international government, and technical communication, he focuses his research interests on intercultural communication, particularly on the ways that online communication technologies affect intercultural interactions. He has taught courses in intercultural communication for Mercer University, and has taught e-commerce, international business, and business communication in the Ukraine as part of the USAID-sponsored Consortium for the Enhancement of Ukrainian Management Education.

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