Technologies and Tensions: Designing Online Environments for Teaching Technical Communication

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> "Play down your programming skills during your job interviews or they won't take you seriously theoretically."
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> (Advisor, on Selling Myself After Finishing my Ph.D., 1991).
>
> "Cyberspace is Platonism as a working product."
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> (Heim, 1993, p. 99).

Introduction: Technology and Traditional Collides

This chapter discusses how technical communication teachers and researchers (in particular, untenured teachers and researchers) who work in virtual spaces need to be aware of the traditional contexts that surround them; that is, we need to acknowledge the complex web of departmental, institutional, political, and extra-organizational factors that envelops our work in the areas of electronic interconnectivity, collaboration, and the virtual distribution of information. Specifically, I assert that as technical communication faculty motivated to integrate technology into our research and our classrooms, we often mistakenly believe that the problem we face is a technical, rather than contextual one.

Beginning with an overview of the appeal the Internet holds for researchers and teachers interested in alternative notions of contribution, collaboration, and knowledge distribution, I describe a robust online learning space that I have been building for several years. I maintain that successfully harnessing new technologies in research and in the classroom depends upon learning to demonstrate the value of using computers to colleagues working in more traditional areas of textual studies. Connecting technology-based pedagogical methods to one's broader research agenda, service duties, and existing institutional infrastructure is critical for the successful integration of computer-based work into technical communication and the academy.

Introducing the Internet: Play and Productivity in Virtual Spaces

The revolution begins with an emerging technology: the Internet—more than simply a highly technical and exponentially growing phenomenon—is also a collaborative set of tools that professional researchers, teachers, and practitioners are only beginning to examine for their usefulness and potential to increase productivity, information dissemination and exchange. Indeed, the Internet consists of many communication and information-gathering tools such as ftp and telnet, listserv, gopher, Veronica, Uncover, e-mail, the world-wide web and MUD/MOO environments. In Mehlenbacher and Hardin, 1994a, and Mehlenbacher, Hardin, Barrett, and Clagett, 1994b, the authors found that collaborative activities were mentioned by approximately half of 40 survey respondents as being one of the greatest advantages of having Internet access.

An additional benefit of Internet collaboration were the speed with which one could contact other professional researchers and practitioners for answers and ideas. Many respondents also claimed that the Internet allowed them to obtain a broader range of information and perspectives than they could receive from colleagues within their immediate organizations. In keeping with recent discussions of the dynamics of online or virtual communities (Benedikt, 1991; Heim, 1993; Woolley, 1993), Mehlenbacher et. al. (1994a; 1994b) also found that over one-third (36%) of the 40 respondents specifically cited the Internet as being important for community-building, most referring to intangible psychological benefits (Rheingold, 1992; Wright, 1993). Table 1 summarizes the tasks that the 40 respondents said they regularly performed using the Internet:

Table 1: Internet tasks performed by 40 technical communicators.

Uses of the Internet	**% Response**	**# Response**
Information-Gathering	82%	32
Collaboration	51%	20
Community-Building	36%	14
Time-Consuming	36%	14
Pragmatic Interaction	21%	8
Money and Time Savings	13%	5
Social Tension	5%	2

With any emerging technology, however, come a host of unanticipated implications and potential shortcomings. Although the advent of personal computing was heralded by some as a technology that would improve productivity, for example, researchers have observed that a relationship between computer systems and employee productivity has yet to be

established (Bullen & Bennett, 1991). And despite claims that technological developments in the home would reduce housework, researchers have noted that it has done nothing of the sort. Mechanized housework requires approximately the same amount of time in the form of a whole new set of tasks including, for example, operating and maintaining vacuum cleaners, repairing refrigerators, cleaning and moving appliances, and loading and unloading dishwashers (Wajcman, 1991).

Both of these examples highlight the need for what Kling and Scacchi (1982) call a web model of technological development: "the planner who uses a web model is more likely to see a technical change (or new policy) as embedded in a larger system of activity, as having consequences which depend on peoples' actual behavior, and as taking place in a social world in which the history of related changes may influence the new change" (p. 4).

Inventing a Learning Space: The TechComm-VC

This chapter took shape shortly after I built and taught using an experimental environment designed to facilitate online teaching, research, information-exchange, and collaboration: goals that technical communicators appear to bring to the Internet. The environment, entitled the TechComm-VC (for Technical Communication Virtual Campus) currently consists of five organizing components:

1. The Technical Communication Virtual Library
2. Web Resources for Technical Communicators
3. The TechComm Listserv
4. "Living" Syllabi
5. The TechComm Multi-User Domain (MUD/MOO)

The Technical Communication Virtual Library

Currently, the technical communication virtual library is under development and consists of a web-based set of documents that link to technical communication source materials available on Internet. Some of these materials currently include course syllabi, summaries of pertinent listserv discussions, workshop and conference materials, and reference lists for professional communicators. Future plans include linking to other sites that list program descriptions, theses, and course options, in addition to the curriculum vita and course materials of relevant technical communication instructors and researchers.

I chose the metaphor of a library for these virtual materials deliberately, believing that students could refer to them as they might refer to hardcopy texts in a traditional library. And, because I determined what materials are and aren't contained in my library, I warned students that they were really being asked to access a special reference room rather than the estimated 40 million sites that make up the library called the world-wide web.

During the course of the semester, I also introduced students to the concept of "firewalls," electronic security fences that keep the web materials of organizations and corporations private and inaccessible by general world-wide web users. Like my library, these "internal-only" web materials represent the world in ways that are consistent with the organization that creates and houses them. Issues of information control and access thus gain attention in class discussions of my web materials; technical communication, in the library that I have designed, privileges certain types of research and marginalizes others.

Web Resources for Technical Communicators

The web resources document links to exemplary web pages designed by corporations, educational institutions, research centers and institutes, and societies like STC (Society for Technical Communication), ATTW (Association of Teachers of Technical Writing), and ACM's SIGDOC (the Association for Computing Machinery's Special Interest Group on Computer Documentation). Assignments in the past have included having students extend the resources to include research materials being produced by NC State's Center for Communication in Science, Technology, and Management (CCSTM), an activity which encourages them to look critically at how other such institutions represent themselves. Other resources include information databases emphasizing human-computer interaction, virtual reality, Internet and world-wide web research.

Two of my research assistants are currently searching the Internet for additional pages that might be of interest to technical communicators and are establishing priorities and guidelines for adding to the resources page. That is, as the Web grows exponentially, it is going to become more and more important that resource managers add new links in a systematic and meaningful way so that Web users are not overwhelmed during their searches for information pertinent to their tasks. (Currently, many Web sites include a "What's New" button for such added information, but most of us realize how easy it is to simply dump uncategorized information into that category without carefully considering how this might affect return users of our pages.)

The metaphor of web resources invites exploration and interaction, and students are encouraged to use these materials as they would if they were practicing technical communicators. After all, most societies and companies are interested in attracting these audiences. Students are also asked to respond to these resources as consumers: why are they present on the web? what are they selling? what extra-organizational web resources do they privilege (one would, for example, not expect an IBM page to point to an Apple one)?

The TechComm Listserv

The TechComm Listserv is a moderated listserv with approximately 200 professional subscribers, teachers, and students largely located in the Research Triangle Park area. The listserv, which has been written-up as a useful resource for people interested in professional writing in several Internet Guide books (e.g., Randall, 1994), carries job announcements, calls for conference papers and research papers, and announces regional presentations of interest to technical communicators. Future plans for the listserv are to incorporate pointers to other listservs that might be of interest to technical communicators (e.g., techwr-l@okstate.edu and utest@clemson.edu).

Students are subscribed to the TechComm listserv when they register in my courses. They are asked to "listen" to the list for one month before actually contributing to it. Ultimately, they are informed that the list contains approximately 200 subscribers, about half of whom work in industry and the other half in the academy. Approximately ten percent of the list's subscribers are international and, though the list is dominated by Research Triangle Park-based subscribers, several of its subscribers are the authors of technical communication articles the students are using in the course. The students are very surprised to learn that they are, in effect, the only "students" on the list. This brings up important issues of audience and effective document design as they relate to Internet communication; for example, many students are surprised to learn that, as moderator of the list, I receive (and could edit if I chose to) all list messages before sending them to the list subscribers in general.

"Living" Syllabi

Course syllabi and attached materials for four inter-related courses that make up NC State's upper-level undergraduate courses and graduate courses in technical communication (ENG 314: Technical Design and Editing; ENG 421: Computer Documentation Design; ENG 517: Advanced Technical Communication, and; ENG 617: Online Information Design and Evaluation). Currently, the living syllabi are used only by NC State students until larger issues of copyright and the distribution of electronic instructional materials have been examined in greater detail. James E. Porter, too, in his chapter in this volume is concerned with issues of ownership and authorship as they apply to electronic texts, and calls for an "electronic ethics" which, he asserts, is "a critical positioning that serves to critique the dominant legal realm." His observation that his home page is "neither a 'home' nor a 'page'—and most of it's not even 'mine'" anticipates my problem with calling "my" site for interesting syllabi "mine."

Since hardcopy syllabi have always struck me as compilations of all the syllabi that have every been used in previous versions of the course, the fact that my web-based syllabus links to other web-based syllabi seems provocative pedagogically. Since no two courses in technical communication ever seem to

look alike, I encourage students to identify and articulate similarities and differences between the "presentations" of the contents of the field.

The TechComm Multi-User Domain (MUD/MOO)

The TechComm Multi-User Domain (MUD, or MOO for Multi-User Domain, Object Oriented) is an experimental MOO that facilitates professional exchange between technical communication professionals, researchers, teachers, and students. During the last two or three years, numerous MOOs have been used to support collaboration and virtual exploration (Anderson, 1991; Taylor, 1992). MOOs now facilitate discussions of issues like postmodern culture (PMC-MOO), new media and technology (MediaMOO), hypertexts and fiction (Brown Hypertext Hotel), bioinformatics (BioMOO), and even the anthropological and social evolution of MOOs themselves (Point MOOt). (For a list of MOOs and their telnet addresses, see Bennahum, 1994, and Appendix A; for a discussion of the pedagogic potential of computer-mediated communication environments, see Curtis & Nichols, 1993, and Unsworth, 1993.)

The TechComm-MOO currently contains the following features:

A Library, which contains online dictionaries and gopher slates (menus that allow students access to information contained on machines located around the globe).

A Lecture Hall, which contains a Conch that allows speakers to silence the room, a Queue that stores audience questions for the speaker, a Slide Projector for displaying extended passages of text, and a Tape Recorder and Tape-Dispensing Machine for recording real-time lectures.

Several Discussion Rooms, which contain information desks, passages to several hypertext documents, and bulletin boards so that users can post notes that might be of interest to visitors to the MOO.

Since MOOs are constantly in flux from version to version of Curtis's LambdaMOO database (the original MOO at Xerox Parc, Curtis & Nichols, 1993), I anticipate that the MOO will undergo numerous revisions before its address is released to the general Internet population (see Appendix B for a glimpse of what scrolls up your screen once you've logged into the TechComm-VC).

Pedagogically, the major value of the MOO environment is its accessibility and its real-time interactivity. Students have been able to participate in guest lecture-style exchanges at pre-arranged times with professional technical communicators from industry and with academic researchers interested in technical communication research and teaching. Some of the guests have included an editor from Lingu Franca in New York, a computer scientist from Athabasca, Canada, a technical communication professor from Canada, and an out-of-state director of a center for computing in the humanities, to name a few. Clearly, pragmatically these "visitors" wouldn't have been accessible to

my class without the technological support. Additionally, because the MOO environment is infinitely extendible by the students (i.e., they can build rooms, objects, new characters, and so on), the setting invites an investment on their parts that is unusual for a typical classroom; students are encouraged to tailor the MOO to suit their personal and professional needs. In fact, most of the objects currently housed in the MOO were built by previous students in the class.

Exploring Pedagogical Dichotomies: Technology and Teaching, Teachers and Students, and Play and Productivity

Revolutionaries aren't always self-appointed: having focused during the past several pages on various Internet tools that support online collaboration, information dissemination and exchange, I would like to turn my discussion in on itself. As a teacher and researcher interested in the opportunities and potential problems that introducing technology into our teaching brings, it is rare that I get the time to reflect on those technologies. In fact, many "techno-teachers" that I meet at conferences appear to share the same unreflective love affair with technology and with the power of those technologies to transform traditional classroom teaching.

Our tendency to de-emphasize many of the problems that we immediately experience when we attempt to technologize our classrooms, I believe, stems from six common (but rarely fully explicated) issues:

Technology enamors us

Most of us are drawn to technology as teachers primarily because we are interested in technology; ultimately, our interest in technology will weave its way into our research and into our teaching, at least if we hope to devote more time and energy to it. Some of our colleagues who received more formal training (for example, in American or British Literature) began working with technology when they were asked to run computer writing labs or when they realized the need for technical or professional writing teachers. In either case, tinkering with technology can become a full-time job that is supplemented with teaching reading and writing.

The "enemy" surrounds us

Many of us are encouraged to play the part of televangelists because we are often surrounded by semi-Luddites (especially those of us located in English Departments) who would just as soon banish new technologies from use in the classroom as face the challenge of learning about them. Indeed, most university structures for tenure and promotion still do not recognize, as a professional contribution, the design and evaluation of software, world-wide web-based course materials and, in general, the experimental use of technology to facilitate teaching. This is not entirely surprising given that, as Richard J. Selfe and Cynthia L. Selfe point out in their chapter, "Just as some English Departments remain unconvinced of the value of technical

communication as a serious scholarly and instructional focus, some traditional scholars consider computer-supported communication facilities unnecessary additions to programs grounded in humanistic traditions" (see also Bernhardt & Vickrey, this volume).

Unfortunately, because many of us feel enormous pressure to produce technology-driven teaching and research success stories, we are also equally compelled to make claims about our technology that are often unsubstantiated by experience or empirical observation (Hawisher & Self, 1991). Thus, I have heard composition teachers who use computer classrooms claim that, with computers, teachers will be able to overcome complex issues like race, gender, physicality, illiteracy, isolation, marginality, pre-constructedness, and so on (see Faigley, 1992, on the benefits of a de-centered classroom).

We ignore the risks

Most of us are motivated to attract interest in new technology and, though we acknowledge the professional risk involved in experimental teaching and the often daunting learning-curve that comes with new technology, we don't want others (that is, our colleagues) to reject technology use in teaching prematurely. Therefore, we often design our demonstrations and introductions to new technologies to hide the many hours and sometimes months that we spent tinkering with incompatible software packages and struggling to discover the correct port for the so-and-so cable so that our large-screen monitors would run from our Sun SPARCstation LX boxes. Because we are interested in cutting-edge technologies, we are also prepared to invest many person-hours to see those technologies work. Hence, we generally don't wait until the bugs have been weeded out of the Microsoft Windows 95 operating system, before upgrading to it. And we minimize the complex problem-solving that frequently takes place when we attempt to integrate new technologies into the way we carry out professional tasks. Unfortunately, our effort to make the integration of new technologies appear effortless further encourages our colleagues to ignore our professional contributions to research and teaching.

Our friends aren't in our departments

Many of us, in our efforts to bring new technology into our colleges and departments, frequently develop strong relationships with those who are commonly defined as the enemy: departmental program administrators, college program administrators, computing center consultants and technicians, and even corporate sponsors. Although the development of such relationships is generally viewed positively by our colleagues, we need to be careful not to blindly venture onto unlabeled turf. Academic institutions have extra- and intra-college and departmental histories that are often difficult to trace; perhaps ironically, a colleague once told me that academic

politics are often more dramatic because the resources that university personnel are fighting over are so scarce. And working with industry practitioners can be even more controversial with some of our more traditional humanities-based colleagues: Carver (1997) has pointed to the extremely uneasy relationship between the academy and industry, especially in a research field as relatively young as technical communication.

We're secretly cynical about the promise of our technology

Most of us, to quote a colleague of mine, have been "seriously burned" by the allure and promise of new technologies. Either we have advocated the revolutionary power of television in teaching, or of MS-DOS machines, or of Videotex systems and, in every case, we have been ultimately disappointed and have learned to approach new technology very carefully. We all generally agree that such technologies give teachers a perfect opportunity to re-examine previously held pedagogic assumptions; but we tend to avoid making the claim that such technologies will "improve" our teaching (at least until we can figure out how to define what it means to improve our teaching).

We're committed to the cause (or, we believe our own rhetoric)

Few of us would deny our conviction that embracing technology—at least in the beginning—is a necessary first step in bringing it into our classrooms, but we would also have to admit that we're sometimes guilty of not taking responsibility for how little we really know about what our technology does to students, communication processes, and learning in general.

These common issues, in turn, have often led us to enthusiastically consider new technologies and to argue strongly with forces on our campuses that are quick to point out technical concerns and constraints we might not have considered. But most of us are also painfully aware of the challenges that face us when we decide to bring technology into our classrooms. It is not that we aren't eager to read and respond to new research on the effects of emerging technology on the way our students learn and communicate but, rather, that we find it difficult to keep up with the pace at which that research gets carried out and published.

Forming On- and Off-Campus Alliances

At NC State, system administrators provide 27,000 students and faculty with the ability to create their own home pages and the ability to link to the millions of existing web resources currently available via the Internet. Those administrators do not, however, allow students or faculty to telnet to MOOs, to create web forms or web-page counters, or to link to NC State's "official" web pages (without special permission). These restrictions are not technological in nature but, rather, pragmatic and tied to system security, copyright, and maintenance issues. Therefore, if technical communication

teachers and program directors are interested in using these types of tools in the classroom, they need to be aware that they must argue for them.

My argument, from the beginning, has been that my interests in teaching are strongly tied to an extended program of research surrounding the design and implementation of the TechComm-VC. Pragmatically, the TechComm-VC project necessitates coordinating my efforts with the campus computing center to insure server support, in addition to requiring approximately one-hundred hours learning the fundamentals of MOOing. At the same time, I've been careful not to let my traditional publishing in mainstream academic journals be dramatically hindered by my interest in working with technology.

Although the TechComm-VC environment is meant to support the teaching of four upper-level undergraduate and graduate courses in technical communication, I am also careful to tie my technical efforts to an elaborate research agenda. My long-term goals are to get funding for the TechComm-VC project from established funding agencies that my colleagues are familiar with (for example, the National Endowment for the Humanities) and from funding agencies that they might be less familiar with (for example, the Society for Technical Communication).

Initial funding from inside the university, though, allows me to promote and explore the relationship between the humanities and engineering and to study the effect of the TechComm-VC's on globalizing pedagogy and professional collaboration. In addition, my preliminary funding base supports the development of undergraduate and graduate courses, and fostered collaborative research, the use of workstation-based distributed computing, and the promotion of tools for virtual/distance education. I have maintained from the beginning that NC State is in very good company when it chooses to commit to research and teaching in the TechComm-VC. After all, other institutions exploring such technological environments include MIT, Xerox Parc, UVa, the University of Waterloo, Clarkson University, Carnegie Mellon, and Stanford University (see Bruckman, Curtis, Figallo, & Laurel, 1994).

My ultimate goal is to introduce approximately 150 technical communication and engineering and technology students at NC State to the TechComm-VC environment. Finally, I have argued that the TechComm-VC addresses an, as yet, unmet need: facilitating communication and information exchange between professional technical communicators and students.

As part of the process, I have also drawn up a preliminary development plan which integrates research, teaching, service, and an overview of existing support structures that I have put in place. I would strongly recommend that technical communication teachers and program directors interested in implementing technologically-based pedagogical environments consider doing the same planning initially, in order to see how their career goals map onto those of their department and institution (see Appendix C for an example plan).

Although the details of one researcher's plan are certain to differ dramatically from one academic setting to another, my point here is that an extended argument that draws on numerous sources of support is the first step any technical communication teacher and program director interested in technology is going to have to take in order to bring technology into the classroom. Perhaps I'd even argue that the best first step begins with exploring new technologies, integrating them into one's teaching and research, and then writing a lengthy argument for their usefulness as the best way to proceed to integrate teaching and technology into one's traditional setting.

Technical Concerns and Constraints: Dotting Our I's and Crossing Our T's

Though a discussion of the technical concerns facing technical communication teachers and program directors who use information technology systems is outside the scope of this chapter, with its emphasis on the interaction between technology and pedagogy, it would be irresponsible to pretend that technical concerns don't sometimes plague us. These concerns, unfortunately, are sometimes so engaging that we lose sight of the larger picture: that we work in departments that, at best, have a very uneasy relationship with all that is scientific and technical. We also lose sight of the fact, as Kling and Scacchi (1982) have asserted, that all technological change is profoundly social in nature.

An excellent example of how social and institutional constraints can influence the technologies that we do and don't adopt can be found on any campus, but I'll draw on one close to home. When users login to NC State's state-of-the-art Unity operating system (which is based on MIT's Project Athena and Carnegie Mellon's Andrew system), they are confronted with the following system message:

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ATTENTION ALL USERS - DO NOT PLAY GAMES ON THIS MACHINE (cc05du) !!! In order to preserve the use of dialup lines and machines for useful work, all games, BBSs, IRCs, and MUDS are not allowed on this machine. Violators will be handled strictly according to Eos/Unity policy, so heed this message. You could lose your Eos/Unity privileges.

Type "policy" to view policies regarding general use of the system, use of public facilities and use of computer games.

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Many teachers and students who see this message express either dismay over or exhibit outright rage toward what they view as a "paranoid" perspective towards these experimental environments. But were they to actually ask university systems people what the rationale for such a policy is, they would

be surprised to find out that there are many. Computing experts would tell them that MOOs concern computer support people because

1. MOOs, like any constantly developing technology, are especially vulnerable to outside attack and computer viruses.
2. MOOs, by nature, allow a lot of ways for sophisticated users to link in and out of the system (security, thus, is an important issue here).
3. MOO Wizards (that is, owners) have numerous ways to assign users access to the system without having to assign passwords (another security concern).
4. MOOs are environments with very powerful properties (if Wizards aren't careful, users can do a fair amount of damage inadvertently).
5. MOOs do not support portability from one version to another, making damage all the more threatening.
6. MOOs swap data poorly and don't take full advantage of Unix's modularity, making maintenance and machine load a serious issue for systems personnel.
7. MOOs don't run and maintain themselves: computing center staff do.

Because MOOs have gained a strong and enthusiastic following among researchers, and because of their novelty in teaching (the first MOO was introduced in North America in 1991 by Pavel Curtis), many teachers are uncomfortable acknowledging some of their technical shortcomings from a systems programmer's point of view. After all, these environments are only growing in popularity; some researchers contend that there are thousands of MOOs operating worldwide and that many of them frequently host between 50 and 100 simultaneous users (Curtis & Nichols, 1993; Rheingold, 1993).

However, as teachers motivated to bring technology into the classroom, it's our obligation to attend to the multiple opportunities and constraints attached to the use of our tools. Otherwise, it's our students and campus support people who suffer the consequences of our poor planning and naive optimism. So it's our responsibility to establish links to the campus resources that can help us make our technological classrooms run smoothly and support student learning.

Conclusions: Learning From Teaching With Technology

The Internet and world-wide web are growing exponentially, and technical communication teachers and program directors interested in their use in the classroom should be warned that working with such fast-moving technology is frightfully humbling. And the learning curve is steep; a colleague of mine, after introducing me to a MOO, warned that integrating this developing technology into my teaching and research would require at least one-hundred hours of uninterrupted programming time, and my experience was that this was an under-estimation. In addition to the personal learning-curve, larger histories / politics between computing and the humanities also require

attention and energy. Frequently, this energy is turned to developing alliances that are nontraditional, with other departments, colleges, and outside the university. And during all this, we are constantly challenged by technical difficulties which abound every time we attempt to add another peripheral to our already tenuously organized hardware configuration.

While all this seems like completely uncharted terrain, however, we often realize that we are working with a very familiar geography. As I write this chapter, the status of the TechComm-VC project is that funding has been difficult to get for the project, technical difficulties have forced me to relocate the TechComm-MOO to another computing center machine, a new semester has begun with a new set of courses to teach, my relationship with the computing center has become more formal due to a campus-wide rise in interest in web-based teaching, the accelerated student demand for online teaching materials has made it even more difficult to be strategic about the design and delivery of online teaching materials, the advent of newer HTML browsers has re-introduced learning into my teaching, and my tenure clock has begun ticking, re-establishing the importance of publishing in traditional, academic, print-based journals.

Kling and Scacchi's (1982) metaphor of the web is very appropriate here, in that surrounding social, political, departmental, institutional, and extra-organizational issues have begun to complicate my original and purely "technical" problem (cf., Mehlenbacher, 1996a). Thus, new questions and opportunities continually conflict with established structures:

Where do I place forty corporately-donated computers?*We have a shortage of space*.

How do I run a virtual class globally?You'll need to consider the practical concerns of the registration process.

How can industry and the academy work more closely with one another?We need to reduce your teaching and allow you make stronger connections.

What do I do with all the new technology?You need to re-educate yourself and learn from your students.

How do I integrate traditional humanities issues with high-technology engineering principles? *We don't currently have structures that reward that combination of interests*.

What happens to the isolated spaces where information is shared privately for a pre-defined price established by a well-defined department/content?

A different terrain, but a very similar geography: it's clear that technical communication teachers and program directors need to remember the web of social and political realities that surrounds them. Thus it becomes less surprising that though there are numerous institutions interested in hiring theoretical candidates who work with high-technology and pedagogy, embarrassingly few institutions seem to be preparing candidates for these

positions. Yet, importantly, our students are patient with the exploratory nature of emerging technology-based courses because they are getting published in international conferences and taking excellent positions with corporations that call for a knowledge of the Internet and its tools.

Ultimately, as developers of Technical Communication Virtual Campuses, we are bound to be humbled considerably and expected to alter our relationship with students, colleagues, and with existing definitions of contribution, collaboration, and knowledge consumption. We will also want to remind ourselves that the obvious goal here is to turn pedagogy into publications and to turn practice into theory in order to maintain our tenure-track positions. After all, we all agree that

1. University structures favor research over teaching and traditional approaches over experimental and technological ones. A colleague of mine who was given half-time responsibility for a teaching position in an English Department and for running a Center for Computing in the Humanities is doubtful that she'll get tenure. The English Department still expects her to publish traditional monographs in hardcopy forums and the Center expects her to write research proposals, produce electronic deliverables, and generate on-going progress reports for corporate sponsors.
2. Teachers traditionally focus on information content and dissemination via proven media (lectures and class discussion) and evaluate well-established "texts" (single author, academic essays). The rewards for developing "real-world" assignments are, at best, unclear. (A colleague of mine in graduate school once exclaimed, "What would an English Major do at IBM?" and I keep that question in mind when I'm experimenting with web-based teaching: my definition of teaching is as eccentric as the definitions of teaching around me.)
3. Universities and industry have very few models for how they might better collaborate to produce a well-trained student- and faculty-body and for how research results can be used by practitioners. (This is the subject of a conference I will be chairing in Research Triangle Park in 1996; see Mehlenbacher, 1996b; see also Stuart A. Selber's discussion of complex relationship between industry and the academy in this volume.)
4. Definitions of productivity rooted in the 35-hour work-week paradigm don't account for the contemporary acceleration of information-exchange brought on by emerging technologies like the world-wide web. If I can collect data using an electronically-distributed survey, summarize it, receive feedback on that summary, and publish it in an electronic journal (all over three or four days), why would I want to invest the two years that it traditionally takes to publish in a hardcopy journal. Faster dissemination of information thus challenges the way we work and solve problems and, ultimately, will re-define success (that is, promotion and tenure) in the academy.

When we choose to bring technology into the classroom, we run numerous risks and invite several potential problems. We draw on real-world problem sets that may or may not make much sense to our colleagues. We deviate from hand-held one-to-the-many assignments and we complicate the simple elegance of face-to-face exchanges over deadlines, worries, frustrations, and so on. Instead, we worry about "whether the system is up" and how what we're doing might supplement or interfere with our students' abilities to understand our course materials.

Or we don't worry, and we trust our instincts that argue that new technologies make us re-examine our pre-suppositions about pedagogy and, therefore, give our students learning environments that are energized, playful, and unpredictable—the stuff of learning. And the stuff of revolutionary thinking, for, whether we like it or not, we are drawing a line between academic notions of traditional rationality and nontraditional playfulness. In drawing this line, it is important for us to remember March's (1976) warning that

> ... the most influential, best educated, and best placed citizens have experienced a powerful over-learning with respect to rationality. They are exceptionally good at maintaining consistent pictures of themselves, of relating action to purposes. They are exceptionally poor at a playful attitude toward their own beliefs, toward the logic of consistency, or toward the way they see things as being connected in the world (p. 78).

Perhaps it is our exceptionally poor ability to problematize our own beliefs that allows us to teach postmodern theories of discourse when we believe that certain arguments are more logically consistent than others, to embrace feminist theories while we practice empirical research, to undermine corporate notions of hierarchy while we struggle to maintain distinctions between Full, Associate, Assistant, Graduate, and Undergraduate certification in the academy, and to continue working with technology in primarily non-technical settings.

Perhaps we just love our technologies.

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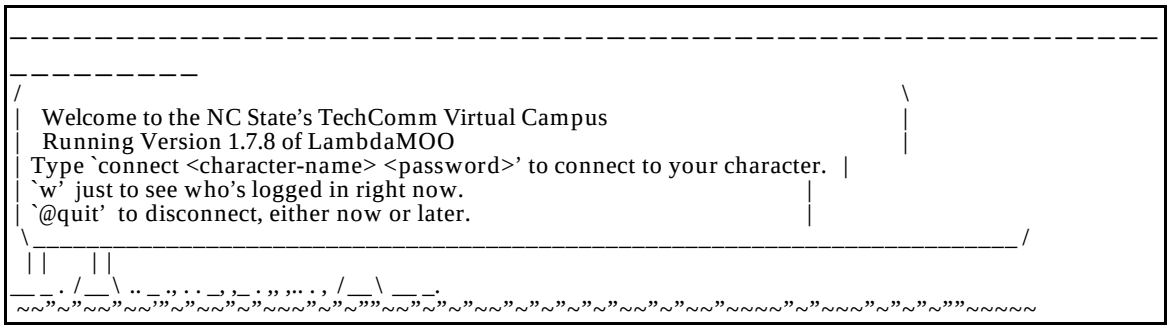
Appendix A—Professional MOOs and Their Telnet Addresses

MOO Name	Telnet Address
Bio-MOO	bioinformatics.weizmann.ac.il 8888
Brown Hypertext Hotel	128.148.37.8 8888
Diversity University	erau.db.erau.edu 8888
LambdaMOO	lambda.parc.xerox.com 8888
MediaMOO	purple-crayon.media.mit.edu 8888
PMC-MOO	hero.village.virginia.edu 7777
Point-MOOt	actlab.rtf.utexas.edu 8888
WriteMUSH	palmer.sacc.colostate.edu 6250

Appendix B—Excerpt of a Typical Session in NC State's TechComm-MOO



>connect Instructor my_password
*** Connected ***
A Secret Room in the Library
A cramped, stuffy room deep in the innards of the library. You see many doors, but decide on one DOOR, for now...

You see Roll_book here.
There are new news items for you to read. Please type "news" to get a summary.
You have new mail (1 message). Type 'help mail' for info on reading it.
Total: 8 players, 6 of whom have been active recently.
@join Bones
You join Bones
Instructor teleports in.
Classroom
An airy, mauve room with chairs that look like the ones in _Star Trek: The Next Generation_. The room is pregnant with knowledge and innovative thoughts.

You see a Chalkboard, Overhead_Projector, and a Microphone here.

Bones (awake), Simkin (awake), Fatboy (snoozing), Sleepy (napping), Marsupilami (awake), Rick (napping), and Bob (distracted) are here.

Simkin says, "I guess we could meet Sunday night, or monday night"
Bones says, "monday is out"
Marsupilami says, "How about Sunday night? My room?"
Bones says, "I have the computer, so... Paige is in Elvis's Playhouse"
:waves and disappears in a blue-gray cloud of mysterious dust.
Instructor waves and disappears in a blue-gray cloud of mysterious dust.
@join Paige
You join Paige

Logging into NC State's TechComm-MOO

Appendix C—Example Plan for Integrating Academic Research, Teaching, and Service Work

Research Goals

Complete two articles on the use of MOOs for research and teaching in engineering and the humanities. Develop the TechComm-VC currently being supported by computing center. Complete grants-in-progress and submit to two well-established funding agencies and one less-established agency.

Teaching Goals

Integrate the TechComm-VC into the following courses: Online Information Design and Evaluation (ENG 617), Advanced Technical Communication (ENG 521), Computer Documentation Design (ENG 421), Communication for Science and Research (ENG 333), and Communication for Engineering and Technology (ENG 331). Extend pedagogic relationships with the School of Design and with one or two universities outside the state.

Service Goals

My relationships with other research institutions and Research Triangle Park-based corporations stand to benefit from the development and promotion of the NC State TechComm-VC-based computing technology. Collect data on user behavior in the TechComm-VC to better establish the usefulness of the new technology. Serve as conference co-chair and program chair for a conference focused on the relationship between the academy and industry. Establish, as part of my duties on an Industrial-Relations Subcommittee, stronger connections with researchers and practitioners interested in communication in the workplace.

Support in Place

List equipment, resources, and students working on the TechComm-VC project. Allocation of funding will be split between maintaining a strong technological infrastructure and funding excellent student research that leads to mainstream publishing. Strengthen existing relationships with the university's extensions office and with professional technical communicators working for local Fortune 500 companies.