WAC Wired: Electronic Communication Across the Curriculum

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As a new century begins, educators are giving special attention to the future of higher education in general and of communication and literacy in particular. New technologies figure significantly in these deliberations either directly or indirectly, as illustrated in this example from faculty at a recent writing-across-the-curriculum workshop at a regional university. Writing in their journals and then brainstorming together, teachers generated a list of expectations from constituencies beyond the campus for universities in the twenty-first century:

- increased emphasis on undergraduate education
- interdisciplinary cooperation and communication
- better integrated levels of education: K–12 and two- and four-year colleges; general education and professional education
- decentralization of project-based education, co-ops, internships, reality-based education: distance learning, videoconferencing, site-based course packaging
- *service* as a good word: outreach to communities, schools, industries, nonprofits, government
- transfer of knowledge more quickly from researchers to users

- quick adaptation to rapidly changing contexts
- computers integrated to help students participate fully in the global information age
- total quality management: team-based projects, client service, continuous improvement
- wise resource management: do more with less
- accountability: conduct regular assessments of all activities and all personnel, including tenured faculty
- more curriculum buzzwords: *communication skills, international, multicultural, computers, interdisciplinary, service learning, collaborative learning, learning communities, lifelong learning, critical thinking,* and *creativity*

Workshop participants paused only briefly to point out some of the apparent contradictions in their list and to comment that legislators, businesspeople, alumni, parents, and educational commissions don't always understand the traditional and important role of universities in developing knowledge and passing that knowledge on to newcomers in specialized disciplinary fields. Participants also realized that the charge to create the "university of the future" was a pointed challenge to "higher education as usual," in which individuals and departments are rewarded for disciplinary specialization but not for service to other constituencies. Most faculty at the workshop wanted to embrace this challenge, evidenced by their attendance. Writing across the curriculum (WAC) and communication across the curriculum (CAC) represent one consequential way, in theory and in practice, for college faculty to respond to the broad educational and political issues of the new millennium. Additionally, as society and our definitions of literacy are transformed by information technology, we are reexamining our perceptions of language and learning in relation to electronic media. As McLeod and Miraglia point out in their introduction to this volume, a new acronym, ECAC—electronic communication across the curriculum (Reiss, Selfe, and Young)—can be added to WAC and CAC as another approach to literacy, communication, collaboration, and community outreach for educational programs and institutions.

The literacy spaces we inhabit now are located both in physical space and in cyberspace and more than ever across classrooms, campuses, countries, and continents. Barbara Walvoord invited us in 1996 to explore new media in a WAC context when she wrote that with information technology, "lines blur between writing and other forms of communication and between classrooms and other learning spaces" (72). In fact, this blurring of boundaries has long been characteristic of WAC, even though the name "Writing Across the Curriculum" never sufficiently recognized the broader initiatives that WAC has spearheaded or supported: oral and visual communication, creative and critical thinking, interactive and collaborative learning, and informal and formal communication with audiences within and beyond the classroom. Addressing the 1997 international Writing Across the Curriculum Conference in Charleston, South Carolina, Elaine Maimon reminded us that WAC really means "active learning across the curriculum," encompassing a variety of ways to help faculty and students make connections with each other and to effect curricular reform. A number of WAC programs have changed their names or institutional structures to reflect this wider scope, becoming CAC programs or participating in variously named centers for teaching and learning, and we can comfortably predict further expansion to incorporate ECAC. Although WAC programs will not necessarily change their names, an expanded focus to include information technology as an instructional tool in classrooms and in physical and cyberspaces beyond classrooms is inevitable, as well as opportune for transforming the culture of learning. In a no-longer-surprising reversal, information technology is encouraging disciplines across the university to work with WAC in an interdisciplinary quest for the effective educational use of electronic mail, hypertext, the World Wide Web, and multimedia.[1]

Information technology is transforming almost every area of our culture, especially higher education and the professional workplace. Some educators are adapting comfortably to the changes; others are resisting for reasons financial, pedagogical, and personal. Many administrators, legislators, scholars, and classroom teachers remain cautious about investing in infrastruc-

ture, bandwidth, intranets, and Internet 2. Fortunately, WAC/CAC program directors and teachers have an opportunity to take leadership roles in these transitions because communication is fundamental to the new computer technologies and because rethinking teaching and learning has long been the foundation of WAC/CAC. In this volume, many contributors address the impact of computer-mediated communication on WAC and CAC. Chris Thaiss emphasizes the ways our definitions of writing itself are being challenged by new media as increasingly "the act of writing means choosing among a huge array of images and forms, only some of which are 'words'" (p. 307). Susan McLeod and Eric Miraglia write, "In addition to shaping the integration of new learning technologies within the proximal world of the traditional university classroom, the WAC community must now look to apply its profound transformational strategies to new models of student-teacher and student-student interaction" (p. 8).

And these new models are the strength of electronic communication across the curriculum. ECAC at its best is student centered and supports the development of an individual's academic and communication abilities for both personal and professional objectives. We began this chapter with a list of broad issues facing higher education, but often the personal meets the professional for students in the very singular process of securing employment. And so the broad issues proclaimed by prestigious educational commissions might be compared with the sparse wording in the "Help Wanted" section of Donna's local newspaper:

- Legal secretary: "excellent computer and communication skills"
- Senior accountant: "good computer skills, excellent oral/written communication skills"
- Sales and marketing assistant: "prepare/edit technical proposals and reports. Must be computer literate"

In the twin context of broad national issues and local student-centered issues, this chapter describes some of the ways WAC/CAC has changed and is changing in the digital age. Not included

here are the thousands of courses and hundreds of programs that use the Internet for instruction, many of which either accidentally or intentionally provide students with one or more language-rich activities that would win the praise of communication-across-the-curriculum specialists. Instead, we focus on those projects that consciously incorporate a computer-supported WAC/CAC dynamic into their classes and programs. Recognizing that some models of information technology on campuses and some distance learning courses will simply transfer drill-and-practice approaches to computers, the digital age's equivalent to multiple-choice scanning sheets, we believe WAC/CAC people in an ECAC environment will advocate (1) an increase in information technology to support the activities of WAC/CAC programs, (2) an increase in alliances between instructional technology programs and WAC/CAC programs, and (3) additional emphasis on communication-intensive uses of technology, or ECAC, among teachers and institutions that emphasize active learning and the development of communication competence in all their students.

WAC/CAC activities at our campuses are certain to have a direct connection to technology. The nature of that connection will vary considerably, just as our technological infrastructures and organizational structures vary. Use of computer-supported information delivery and collaborative writing tools is sometimes institutional, sometimes programmatic, and sometimes the project of a couple of enthusiasts who set up a few computers or a simple internal network or who take advantage of Internet connections to establish e-mail exchanges among students in their own classes or with other audiences. More elaborate models include Web-based classes and multimedia projects that communicate verbally, visually, aurally, and interactively within and between classes and into the community. Some are funded generously, others meagerly. To place the future of WAC/CAC and communication technology in context, "WAC Wired" presents a short history plus descriptions of a range of approaches to ECAC currently in use even as technologies and our related pedagogies continue to change. And so at the new century's beginning, we revisit, this time online, writing and learning across the curriculum.

A Short History of Electronic Communication Across the Curriculum (ECAC)

The computers that transmit information within and among organizations are increasingly important on college campuses. In *The Campus Computing Project,* his annual survey of information technology in higher education, Kenneth C. Green of the Center for Educational Studies of the Claremont Graduate University states, "Students of all ages and across all fields come to campus expecting to learn about and also to learn *with* technology" ("1998 National Survey"; emphasis added).[2] His survey reports significant increase in the use of e-mail and of World Wide Web pages "for class materials and resources." Administrators cite faculty development and technological support for faculty as among their most pressing concerns. Clearly, WAC/CAC programs must and in many cases already do respond to the faculty development needs with ECAC workshops and resources for using new media to communicate effectively.

Increased numbers of and upgrades to computer labs in campus buildings and dormitories, along with increased personal computing as the price of equipment goes down and the use of the Internet becomes more prevalent in the home as well as the workplace, suggest opportunities for WAC/CAC programs to expand their activities and audiences to include new technologies. Significantly, because the use of e-mail and most Internet resources still involves primarily text, people using these resources are always writing, always reading. Even when using the World Wide Web, with its increasingly glitzy graphics and growing commercialization, students and others are reading, conducting research, making critical choices, and, if there's a feedback form or a threaded discussion, writing, perhaps even joining an interactive discussion. As a result, students are writing for their classes across the curriculum even when they are not formally enrolled in a writing intensive course. They are also writing to their grandparents and to friends and to cyberpals in chat rooms, corresponding with audiences who take their writing seriously.

Many of the key elements of WAC/CAC in the 1970s and the computers-and-composition movement of the 1980s intersect

today as ECAC. WAC encourages all teachers to value their students' writing and to respond to it with guidance for improvement rather than with discouragement or punitive remarks. The incorporation of multiple drafts, peer response, and draft conferences into classes across the curriculum, and the establishment of writing centers that support students from every area of a college, are among the ways WAC/CAC has influenced teachers whose primary interest is generating "better writing" on student tests and papers. In his chapter on research in this volume, David R. Russell reports that by studying writing themselves, faculty "critically reflect on their practice and change that practice" (p. 291), a WAC/CAC outcome that our programs can extend to critical reflection on computer-mediated communication across the curriculum. Teachers across the curriculum are also aware of employers' demands for better writing. Russell has written elsewhere that "one characteristic of our post-industrial society is a recognition that competitive advantages come through more effective communication, often written, among workers in all levels and roles" ("Writing Across the Curriculum" 68).

The business world and writing instruction met comfortably around the computer keyboard in the late 1970s and 1980s as writing teachers discovered the benefits of word processing for editing and revising and, by the end of that decade, for text sharing over computer networks. Writing teachers, already the leaders of communication across the curriculum on many campuses, thus became early promoters of computers across the curriculum through their writing centers, WAC/CAC programs, or informal conversations with colleagues. Nonetheless, as Cynthia L. Selfe writes, most faculty "seemed prone in those early years to want to use computers to address surface-level correctness rather than to encourage writing as a way of thinking." In the 1990s, however, as the personal computer became more widely used and as faculty desktops became connected to college networks and the Internet, "WAC faculty in a range of disciplines began to experiment with writing-intensive learning activities" (Selfe xii–xiii).

Recognizing this trend, Barbara Walvoord emphasizes the need for WAC programs—traditionally strong builders of alliances—to develop partnerships with instructional technology

specialists (72). After all, at many colleges around the country, WAC/CAC leaders, writing center directors, and writing teachers have been early users of information technology and have participated in institutional technology initiatives, in some cases administering those initiatives, as Karen Schwalm does at Glendale Community College, as Leslie Harris does at Goucher College, and as Trent Batson did for nearly twenty years at Gallaudet University. The director of one national instructional technology project—Steven W. Gilbert of the Teaching, Learning, and Technology Group (TLT Group) affiliated with the American Association for Higher Education—regularly highlights the pedagogical groundwork of faculty in computers and composition. The TLT program also was allied with the Annenberg-PBS grant-funded Epiphany Project, directed by Trent Batson and Judy Williamson, a national professional development initiative directed primarily at writing teachers but always with an ECAC presence because several of the project leaders also were associated with WAC/CAC at their campuses.

That writing teachers and WAC/CAC program heads have become institutional leaders of ECAC is not surprising, for WAC and computers-and-composition grew up almost side by side at Michigan Technological University, where Toby Fulwiler and Robert Jones of the Department of Humanities (chaired by Art Young) led workshops for faculty beginning in 1977. Also at Michigan Tech, Cynthia L. Selfe and Dickie Selfe began building the Center for Computer-Assisted Language Instruction in the 1980s, now the laboratory for the summer workshop on computers in the writing intensive classroom, as well as the center for writing to support students in engineering and other disciplines. In his chronicle of the early conjunctions of WAC with technology, Mike Palmquist dates the first recorded activity as 1983, when Kate Kiefer and Charles Smith used Writer's Workbench with engineering students, a project expanded by Muriel Harris and Madelon Cheek. According to Harris and Cheek: "This can lead to a stronger interest in writing instruction within their [engineering] classrooms, drawing them into the writing-across-the-curriculum movement via the computer" (qtd. in Palmquist 380; Harris and Cheek 5). A few years later, Nicholas Gordon and Susan Mansfield wrote

that "it makes sense to expand a writing-across-the-curriculum project into a computers-across-the-curriculum project" (qtd. in Palmquist 380; Gordon and Mansfield 11).

In her chapter on writing centers in this volume, Joan Mullin describes the impact of technology on writing centers and WAC, where "the connection between instructor, student, and WAC and writing centers provides generative feedback through continual reflective assessment about the learning process" (p. 190). At least two books now connect writing centers with computer-mediated communication. In *Wiring the Writing Center* (Hobson), the chapter "WAC on the Web: Writing Center Outreach to Teachers of Writing Intensive Courses" (Kimball) deals directly with the relationship between writing centers, WAC, and technology, while other chapters do so less directly; after all, the mission of most writing centers includes outreach across the disciplines. According to *Taking Flight with OWLS: Examining Electronic Writing Center Work* (Inman and Sewell), at the end of the 1990s, many teachers across the curriculum were using WAC/CAC online in their individual classes or in collaborations with teachers in their own or other disciplines, and growing numbers of schools and colleges have incorporated technology into their WAC/CAC or writing programs or have included WAC/CAC as partners in their technology professional development programs. In selecting its four Colleges of the Year for 2001, Time Inc. and the Princeton Review focused on writing across the curriculum, naming Sarah Lawrence College, Cornell University, Longview Community College (Lee's Summit, Missouri), and Clemson University. Integration of electronic communication was one of the noteworthy characteristics of Clemson's program, and electronic communication at Tidewater Community College was mentioned as "in the running" ("College of the Year").

The Middle Ground: Writing to Learn and Learning to Write Online

WAC encourages the instructional use of various functions of written language for learning and communication in the belief that such practices strengthen students' language and critical

thinking abilities. Although perhaps we overgeneralize, we sometimes say that the primary function of writing in classrooms has been for testing, evaluation, and demonstration of skills mastered, content learned, problems solved, or homework completed. WAC asks us to use writing for other not mutually exclusive purposes such as "writing to learn," in which emphasis is placed on using written language to learn new and unfamiliar content or to develop analytical or creative habits of mind, rather than to demonstrate how much has been learned. In other words, in writing to learn, mistakes, false starts, hallelujahs, connections, and misconceptions all are viewed as part of the process by which learners learn. Most WAC proponents believe that these two functions should be integral to all writing intensive courses and often label them informal and formal writing, or writing to learn and writing to communicate, or expressive and transactional writing. These two functions have never been viewed as totally distinct, but rather as existing on a continuum on which some of the writing we do in classrooms falls somewhere in the middle. With the advent of ECAC, this middle ground has gained a more prominent focus. At California State Polytechnic University, Pomona, for instance, where Carol Holder served for many years as director of both faculty development and writing in the disciplines, WAC has been integrating information technology for more than a decade, recently emphasizing "electronic kinds of informal writing for an audience (an interesting hybrid of expressive and transactional modes), and radical changes in the features of 'text' with the possibilities that hypertext/web publishing allows" (Holder).

The chart in Figure 3.1 helps us consider further the "interesting hybrid" of "conversational learning" and ways that electronic communication tools can support active and engaged learning. We view this chart as a starting place and a heuristic; it is not meant to construct a universe of discourse but rather to suggest the fertile ground for the development of an interactive discourse that lies between personal discourse and public discourse. On the left side of the chart, personal discourse exhibits the familiar characteristics of informal, expressive writing. This is the discovery writing that writers do for themselves in places such as journals and notebooks, and that word processing and e-

mail preserve in electronic journals or word-processed freewrites. On the right side of the chart, public discourse exhibits the familiar characteristics of transactional, formal writing, often composed in the form of essays and reports written to a distant audience.[3] In college classrooms, public discourse is often referred to as academic discourse, the language of the academy in general, or more specifically, the language of the intended audience—for example, the discourse of physics, or the discourse of political science—and a generally agreed-on goal of most college composition courses is to teach students to write this academic discourse. For students, one challenge is to figure out how to write like an academic or like a physicist or a political scientist before actually becoming an academic or a physicist—that is, before knowing what a physicist knows and before acquiring the habits of mind and discourse conventions of physics that come with knowledge and experience in that discipline. Such a rhetorical situation sometimes leads students to "fake" writing like an academic and thereby produce texts that teachers over the years have referred to as dummy runs, pretend writing, or "Engfish."

Our chart visualizes in the center column the actual and virtual space of the classroom, the "middle ground," where students gain knowledge, develop scholarly habits of mind, and acquire rhetorical and communication competence in a variety of public and academic contexts. It is that interactive social space where writers can combine their existing knowledge of content and inquiry with the new knowledge and experience they are acquiring in a particular course in order to generate texts for a "real" audience of classmates. In the process of such an interchange, knowledge is generated collaboratively, and a discourse, in some ways unique to those participants, is created that we situate in the middle ground. Electronic media have been facilitating such discourse in networked environments where students write to and for each other in a place where it is safe to practice the language of a discipline. E-mail discussion lists (listservs), class or Internet newsgroups, and threaded Web discussion forums promote collaborative writing in the language of the learner and do not require students to be in the same place at the same time to engage in these conversations. This discourse activity of the middle ground combines the writer's existing language and

	Personal Discourse	**Classroom Discourse**	**Public Discourse**
Function	*Expressive Writing* ■ Self-discovery ■ Inner speech	*Interactive Writing* ■ Conversational ■ Dialectical	*Transactional Writing* ■ Informative ■ Persuasive
Purpose	Explains to Oneself	Explains to Classroom Colleagues	Explains to Distant Others
Audience	*Self and Trusted Others* ■ Privileges language of learner ■ Accountability to self	*Classroom Community: Familiar and Known* ■ Privileges language of classroom community ■ Accountability to classmates	*Distant and Other: Unknown* ■ Privileges language of critical audiences ■ Accountability to public
Genre	■ Journals ■ Diaries ■ Logs ■ Notebooks ■ Freewrites ■ Braindumps	■ Letters ■ Notes ■ Questions ■ Poems ■ Parodies ■ E-mail ■ Dialogue journals	■ Essays ■ Articles ■ Reports ■ Proposals ■ Memos ■ Multimedia ■ Web publications
Response Time	Immediate: Shaping at Point of Utterance	Quick: from "Real" Audience—Visible and Tactile	Lengthy: to Publication or Presentation
Classroom Environment ■ Social and collaborative ■ Respects diversity and risk taking ■ Active learning and interactive teaching ■ Motivation for reading and writing			
Developing Knowledge That Is Personally and Professionally Useful			

FIGURE 3.1. *Classroom discourse and writing across the curriculum.*

rhetorical practices with those of the academy under the tutelage of the teacher, in most cases the more experienced academic practitioner. The goal becomes not to pretend to know and to communicate but actually to do so within the context of being a novice writing to a known "real" audience of other learners on- or offline within a new course or field of study.

This chart on classroom discourse and writing across the curriculum is speculative and dynamic. The three columns should be imagined as on a continuum; most genres can fall in any column or between columns or in more than one column. E-mail, poems, essays, or letters can be written to fulfill any of the three

purposes or a combination of them. All writing, in some sense, is personal, and all writing, when read by others, is public. Further, our chart suggests that ECAC does not create new rhetorical forms nor represent a major paradigm shift, but rather represents a useful way to view written, oral, and visual language in both traditional and computer classrooms. Viewed this way, this visualization assists us in "reading" student writing in the context of "conversational learning"—what many of us are doing for the first time with the advent of the Internet, e-mail, and computer conferencing. And it suggests a powerful pedagogy for the development of students' language and critical thinking abilities. It formulates for teachers and students a recursive and dialectical language process in which the cognitive and social inform each other in the development of writers and thinkers. It helps us understand the learning that occurs as teachers across the nation experiment with ECAC activities in courses within and across disciplines.

Teachers are discovering or rediscovering "middle ground" pedagogies as they implement projects that use new technologies to aid student learning and to improve communication with their students and between students in their classes. For example, WAC/CAC principles informed the use of newsgroups in educational psychology classes when Lawrence Sherman at Miami University designed activities for extending communication and collaboration in response to articles in the journal *Teaching of Psychology.* Finding that students read, reflected on, and responded to each other's electronic postings in ways that led by the end of the term to more complex thinking, Sherman concluded, "While the strategies . . . obviously take up more instructor time in reading, responding and evaluating, . . . the gains in student writing abilities and critical thinking (rhetoric), and the motivating stimulation of the class discussions are worth the efforts."

At the University of North Carolina at Charlotte, Deborah Langsam introduced "biochallenges, . . . questions that asked for applications of the material under study," to her nonmajor biology students, who responded sometimes with applications and sometimes with additional questions, which Langsam considered to be a success in ways that WAC advocates will recognize: "Even for those students who simply had questions—and there were

many—the e-mail was instructive; it provided (1) a place to try to articulate them, (2) a person who would respond, and (3) an opportunity to learn just in the putting of the question" (Langsam and Yancey 236).

In her literature classes for engineering students, Paula Gillespie of Marquette University found that e-mail journal exchanges led resistant students (resistant to literature, not computers) to discuss fiction enthusiastically and "not only allowed students to write to learn, but . . . allowed them to see how others wrote to learn" (230). After using a read-write-respond approach for an online southern literature class at Loyola University, Barbara Ewell wrote, "The high quality of student engagement and learning that resulted more than convinced me that this kind of structured electronic discussion certainly can substitute for the classroom discussions that many teachers most fear losing in delivering their courses electronically." Featured in *Learning Literature in an Era of Change: Innovations in Teaching* are chapters on incorporating electronic communication—in particular, multimedia—into the teaching of both undergraduate and graduate literature and literary theory courses (Hickey and Reiss).

Many projects incorporate a variety of informal and formal writing tasks in various combinations of print and electronic media, thus reflecting the reality most professionals encounter in their workday lives. For example, Teresa M. Redd of Howard University taught an all-black composition class of engineering students that was linked with a predominately white graphic design class at Montana State University taught by Stephanie Newman-James. E-mail enabled these two classes, 1,600 miles apart, to produce a print publication about racism, with essays by Howard students, graphics by MSU students, and reprints of e-mail exchanges from both groups. Just as important as the development of students' rhetorical and electronic abilities was the knowledge gained by both groups about the difficult social issue of racism. In her essay describing this project, Redd concludes with the words of an MSU student: "The experiences you and your friends have gone through is something I don't have to think about very often and they are startling and painful to read. . . . I truly hope that being able to work together on this project will result in some new understanding and breaking down of barri-

ers" (Redd 146). Another approach that involves the interplay of the visual and the verbal is June Woest's e-art field trips for her online art appreciation courses at Houston Community College. After their visits to art Web sites, students report to a class bulletin board in one of five designated "writing styles" that include making up a story, describing design elements, and using adjectives. She observes that "the quality of the student's written communication skills improve while understanding and interpretation of the visual arts deepen" as a result of their online work.

Electronic communication also helps establish connections beyond classes, colleges, and countries. For instance, formal debate across international borders links business students from the University of Rhode Island with counterparts in Turkey and Germany for a project called International E-mail Debate, guiding students "to understand the constructed nature of each debate position and to appreciate the differences of perspective rooted in divergent cultural experience" (Shamoon 158).

These examples illustrate the benefits for teachers across the curriculum that communication-rich uses of computers have long brought to writing teachers. They also demonstrate the direction that new technologies can take within WAC/CAC programs that incorporate ECAC. With e-mail at their fingertips, teachers across the curriculum can use writing-to-learn online to encourage participation in the writing-as-thinking process, to build communication confidence and competence, to establish authentic peer audiences, and to provide a printable record of the exchanges that subsequently can be used as study guides and resources for planning formal papers. Students learn to use the discourse of the disciplines informally and to ask questions either privately with e-mail to the professor or more publicly with e-mail to class groups, learning even as they frame the questions for their readers.

Collaborative Learning and Writing Online

Nearly a decade has passed since Thomas Barker and Fred Kemp described the still-new concept of the collaborative, networked writing classroom as "enfranchising, open, and egalitarian," and its theory as "an application of postmodern pedagogy to class-

room needs" (23). The same year Lisa Ede and Andrea Lunsford wrote:

> Nowhere are the competing and disparate definitions of selfhood and collaboration more apparent than in the technological revolution. . . . [W]e must find ways of describing—and valuing—forms of collective or collaboratively generated and electronically disseminated knowledge, knowledge that will not easily fit into our old forms of individual intellectual property. (viii–ix)

Although they were concerned primarily with writing and the teaching of writing, these two collaborative pairs anticipated with their social constructivist perspectives on technology those concerns that would soon confront teachers from every discipline in what we now call ECAC.

Information technology offers a range of tools that make collaborative learning easier and perhaps inevitable. The sharing of quantities of information across distances at a speed more like a telephone message than a telegraph, and the ease of editing even text-based electronic mail messages—for example, writing in ALL CAPS between the lines to distinguish commentary typographically from the original message—gave writers new ways to collaborate faster and at a detailed interlinear level that soon would be developed further as word processors incorporated comment features and text comparison markings similar to those used by professional editors. Pop-up windows, colored type, and yellow highlight swashes superimposed on drafts in progress could pass back and forth between writers, editors, and collaborators to clarify who had changed what.

Writing teachers were quick to adopt these word-processing enhancements that were developed for the business world. The ability to save and compare multiple drafts was a perfect adjunct to process writing. Copy- or cut-and-paste techniques supported revision well. Writing teachers also were early adopters of the groupware that businesses had been using; early "real time" conferencing tools such as the ENFI project, Real-Time Writer, Daedalus InterChange, Connect, Aspects, and CommonSpace were designed by or in collaboration with educators to take advantage of the writing-to-learn capabilities of these shared writing environments. Internet-based MOOs (multi-user domains,

object oriented), chat rooms, forums, and new whiteboard technologies that allow people to write synchronously or asynchronously on the same document are extending this capability even further.

The conversational aspects of synchronous shared writing spaces provide alternative discussion media for any subject, as evidenced by the use of these platforms outside of writing classes. At Virginia Tech, for example, collaborative writing software has been used by teachers in history, biology, and art history. It is not surprising that English-as-a-second-language or foreign-language instructors were early adopters of the tools that encouraged students to write to each other online either in networked writing environments or with Internet connections to students in other countries.

The Internet has expanded opportunities for writing online in elementary, middle, and secondary schools as well. Pamela Childers, director of the Caldwell Writing Center at the McCallie School, Chattanooga, Tennessee, collaborates with faculty across the disciplines not only to use writing for learning but also to use the World Wide Web and e-mail to support instruction. She sees the advantages of using "the visuals of technology to help students learn, think and verbalize their thought," but cautions that "people contact needs to be made at the point where students and faculty should encourage appropriate interaction for intellectual, social, spiritual, and physical growth." The George School, a private secondary school in Pennsylvania, incorporates computer conferencing in history, science, foreign language, ESL, and English instruction (McBride). And at Pioneer High School in Michigan, history teacher Robin Wax uses synchronous computer conferences to provide

> the multicultural classroom environment my students so desperately need. The use of Writing-to-Learn methods with the history curriculum has pulled together ideas rather than separated them. . . . The format of computerized instruction makes access to ideas and to other learners and to means of expression easy, fun, and permanent.

Efforts to establish links between classes in the same and different disciplines, in the past restricted by complex exchange

logistics, have been made easier by Internet chat rooms and MOOs, where students can meet online from computers anywhere on campus, anywhere in the world. Online pals became the pen pals of the 1980s and 1990s. Same-time conversations with the immediacy of telephone calls and the reflective and archival advantages of text were especially appealing in classrooms where a single computer could provide a connection to students on other continents. Many World Wide Web sites now provide gateways for matching classes at every school level.

Learning communities also are well served by computer communication. At the University of South Florida, for example, a FIPSE grant project under the direction of Joseph Moxley is supporting the integration of both WAC and technology into USF's Learning Community Initiative, and its 1999 conference, Creating and Sustaining Learning Communities: Connections, Collaboration, and Crossing Borders, focused on the use of technology to support learning communities ("Learning Communities"). Members of the English department are collaborating with colleagues in social science, history, non-Western perspectives, and art to teach and grade collaboratively, working with the same fifty students over a two-year period. This initiative, says Christian R. Weisser, was a direct response to WAC and to the university's need for "assessment, organization, and integrated assignments." Through listservs, MOOs, and student Web pages that link students and teachers across the curriculum, technology can "facilitate and 'bridge the gaps'" while strengthening writing for thinking and learning as well as writing for academic success. Computer communication also plays an important role in the George Mason New Century College learning community model described in this volume (Zawacki and Williams, Chapter 5).

Programs: ECAC and WAC, Writing Centers, and Centers for Teaching and Learning

At present, few collegewide programs formally identify themselves as Electronic Communication Across the Curriculum or by a similar name. Programs within a wide range of departments and initiatives do exist, however, many of them shared ventures

among writing or WAC/CAC programs, writing centers, technology centers, and centers for teaching and learning. The need for such explicit connections has been apparent to many WAC leaders (Walvoord; Thaiss). In her travels to campuses throughout the country, Cynthia L. Selfe reports that one of the most frequent questions from faculty is, "How are other teachers using computers to support writing across the curriculum?" (xiii). Centers for teaching and learning have been in the forefront of recognizing that communication-intensive pedagogies best serve students as their teachers incorporate new technologies into instruction.

At the University of Illinois at Urbana-Champaign, Gail E. Hawisher of the Center for Writing Studies, which houses the WAC program, has been active in the engineering department's asynchronous learning network (ALN) project. "Both WAC and ALN," Hawisher and Pemberton (formerly part of the program) report, "are capable of reshaping the social contexts of classes if we bring to them the necessary kinds of critical thinking and pedagogical values that successful educational innovations require." Reflecting on the electronic messages of an engineering class, they conclude that "in good WAC fashion the students often come upon the answers to the problems they pose after they have been able to articulate the problem and after they write (or talk) it through with classmates" (27–28).

In another WAC-influenced technology program, the Mellon Multimedia Courses project at Spelman College in Atlanta, a division of their Comprehensive Writing Program, has electronic communication as its core (Hocks and Bascelli). Psychology, art, Spanish, and French faculty have been active in Spelman's initial projects to use electronic communication.

Some of the connections between WAC/CAC and information technology are piecemeal, some are still in the form of initial steps, and a few already combine to comprise full-fledged programs. In 1996, Patricia Williams, director of the Across-the-University Writing Program at Sam Houston State University,[4] wrote to the WAC-L listserv that the program's workshops and newsletter have featured writing using technology; "I think we are making progress in learning how technology can enhance

both student and faculty writing." Writing centers and WAC/CAC programs around the country have been making similar progress a few classes and workshops at a time. One comprehensive initiative is the University of Missouri–Columbia's Institute for Instructional Technology (MUIIT),[5] a group of faculty and staff organized by the Program for Excellence in Teaching to facilitate use of educational technology to enhance teaching and learning. MUIIT has strong ties to the distinguished campus writing program directed by Martha A. Townsend. With its extensive and clearly organized links to resources under the headings Enhancing Traditional Teaching, Changing Pedagogy, and Changing Content or Epistemology, along with examples of projects at the university and elsewhere, MUIIT hosts institutes that use an online daily journaling form. It also features discussion lists for making learning active. The writing program has its own direct ECAC initiative in "Expressive Media: Composing with Technology," developed by Andy White of the writing program with Peter Campbell and Marsha Lyon. In an e-mail message to WAC-L, Townsend emphasized that "writing to learn" in the disciplines includes the use of multimedia.

The Virginia Tech professional development program[6] designed to train faculty to incorporate technology into their courses in meaningful ways has generated communication-rich approaches that include a history professor using networked synchronous conferencing to stimulate interaction in a classroom; a philosophy professor incorporating threaded discussion forums into Web-enhanced classes; and a professor of veterinary medicine having students author multimedia presentations for their classes. Carol A. Bailey, director of the Virginia Tech University writing program, writes that her office has close ties to both the Center for Excellence in Undergraduate Teaching and Educational Technologies and the online courses at their cyberschool. These programs are visible through their Web site, which includes Peter Shires's reflections on the effort and time involved in retooling his veterinary medicine course, a process that "does focus faculty attention and results in improvements to course content that would not otherwise be accomplished. . . . As our specialties involve considerable visual and audible evaluation of problems, this methodology of teaching is well suited to our needs."

For many faculty who attend workshops to learn how well-chosen technology applications can enhance their teaching, the response is similar to Shires's and familiar to those who conduct WAC/CAC/ECAC workshops: the focus on rethinking their courses and curricula is as important as learning new pedagogical and technological strategies. Intrigued by the possibilities of WAC/CAC/ECAC, educators look for ways in which freewriting, journaling, multiple drafts, and collaborative problem solving might guide their students' learning. In other words, WAC/CAC does indeed drive course and curricular change.

So too does information technology, despite claims that the pedagogy should drive the technology. Influenced by the editing opportunities of word processing, writing teachers sought ways to bring these tools to their students. Before long, their colleagues also wanted their students' papers spell checked and printed in Times Roman. Impressed with the information exchanges facilitated by e-mail, teachers looked for ways this platform could serve students, and thus developed discussion groups and paper exchanges. Encouraged by the universality of HTML and the dynamic communication combination of text, graphics, sound, and video, teachers taught themselves and their students the discourse of Web pages, a precursor to Web portfolios.

Before the widespread availability of e-mail and Internet computer conferencing, internal synchronous environments made possible reflective learning communities within classrooms fortunate enough to have networked computers. WAC/CAC teachers who participated in such communities introduced their colleagues in other fields to the benefits of WAC's write-to-learn emphasis through informal freewriting and other methods of prewriting, collaborative planning and exploration of topics, peer response, and multiple drafts. WAC became wired.

Reflections on the Future of Electronic Communication Across the Curriculum

We cannot predict the future of WAC/CAC/ECAC in relation to technologies that are changing so rapidly. Not included in this chapter but on the near horizon for expanding ECAC, for ex-

ample, are desktop videoconferencing and speech-generated text production. We can predict, however, that such changes will continue to bring new energy to WAC/CAC programs as they consider their place in the academy of the twenty-first century. We anticipate increasing alliances between WAC and other departments as pedagogies promoted by communication across the curriculum offer some of the best instructional uses of information technology. When she wrote the following statement in 1996, Reiss was thinking of then-innovative uses of computers in her own college's initial projects: "What is e-mail but the epistolary pedagogy so often used by WAC advocates? Now students use writing-to-learn letter exchanges not only across classes and campuses but across the world. What are newsgroups and chat rooms but tools for the kinds of collaborative conversation and composition WAC has modeled?" (722). Today these approaches are commonplace.

Students whose intellectual lives sometimes seem isolated or fragmented might find that the immediacy of electronic media helps them connect, as did students in Mary Beth Oliver's Introduction to Communication Research course at Virginia Tech. One student responded to an anonymous class evaluation that e-mail "makes a large class seem smaller and the teacher more accessible" and provides a "self-evaluation process of what we understand or don't understand." Such self-assessment online resembles the familiar WAC activities on paper of freewrites, microthemes, question-and-answer pairs, one-minute essays, five-minute responses, and journals. With an optional e-mail listserv, students can get timely feedback from classmates and professors in the "middle ground" of WAC/CAC/ECAC activities that new technologies generate almost automatically. With teacher guidance, such e-mail lists can also support more structured write-to-learn activities such as required daily or weekly messages, small-group problem solving, and posted focused freewrites.

Electronic portfolios are likely to become more widespread, perhaps driven by employer demand. Multimedia résumés can enhance job searches and graduate school applications; they might even become the standard for the future. A first-year writing class, or a general education core course, or a student orientation class might be the first step in creating a Web site that presents se-

lected student projects to represent their work in a variety of courses. Most of these projects are likely to involve substantial writing and other forms of communication, and their public nature on the Web might lead the teachers who "approve" these projects for publication to become more directly involved with WAC/CAC/ECAC. For in some ways, electronic portfolios may lead to a natural but public performance assessment for both students and teachers. At least one college has initiated such a requirement beginning with the class of 2000, according to a report in the *Chronicle of Higher Education.* The academic use of the Web "is meant to enhance the academic-advising process by helping students to reflect on the whirlwind of their college experiences and to articulate what they're getting out of Kalamazoo's offerings" (Young, "A New Graduation" A23).

Portfolios are not a new concept in writing classes; electronic portfolios were featured in a 1996 special issue of *Computers and Composition* (Yancey) and constitute one of the four perspectives of *Situating Portfolios: Four Perspectives* (Yancey and Weiser). The implications for broad professional use are suggested by Kristine L. Blair and Pamela Takayoshi, one of whose students used Hypercard to build a writing portfolio "not unlike the construction of a prospective employee portfolio. It opens with an introductory welcome to her portfolio, followed with a copy of her resume, and then particular samples of her design work" (362). When such portfolios are posted on the Web for all to read, one of the perceived gaps between personal writing, classroom writing, and public writing will have been bridged, for such writing will serve the purposes of the individual student, of classroom instruction, and of formal public communication.

David R. Russell ends his historical overview of college and university writing with this insight:

> With WAC, the old battles between access and exclusion, excellence and equity, scientific and humanist worldviews, liberal and professional education, all come down to very specific questions of responsibility for curriculum and teaching. WAC ultimately asks: in what ways will graduates of our institutions use language, and how shall we teach them to use it in those ways? (*Writing in the Academic Disciplines* 307)

"WAC Wired" suggests that future graduates increasingly will use computer technology to communicate and to learn, and that educators will increasingly use computer technology to teach students to communicate and to learn. We consider traditional WAC/CAC pedagogy to be among the most effective and available ways to carry out this task. But we are aware of the dangers in doing so and the major hurdles to overcome.

In 1990, before the rise of ECAC, Art Young and Toby Fulwiler delineated what they called "the enemies of WAC," that is, those attitudes and practices that subvert WAC's efforts to transform education: resistance from faculty, resistance from students, resistance from English departments, compartmentalized academic administration, faculty reward systems, departmental priorities, unstable leadership, and testing mania. This litany is familiar to WAC/CAC practitioners, and we might update it for the electronic age simply by adding computer phobia. But there are at least four areas of concern we should pause to consider further: issues of access, of the faculty reward system, of copyright and intellectual property, and of academic freedom.

Of particular importance for ECAC are the access and equity concerns incumbent upon such expensive tools as computer networks. One major concern is that the pedagogical benefits of information technology will benefit a new elite with access to powerful computers and networks, thereby creating a new information gap and widening the existing economic gaps between wealthy and poor school districts, poor and middle-class students, and native-language speakers and international users with little or no English-language proficiency. Still, this peril is accompanied by the enormous promise of such technology that leads faculty to advocate for improved general student access in higher education and that leads community members themselves to wire their local public schools, libraries, and community centers on Net Days. At one time, books, televisions, and ballpoint pens were out of the reach of nonwealthy citizens; free libraries, less expensive televisions, and disposable pens have made these technologies widely available. Educators must continue to press for universal access to information and tools for communication at all economic and educational levels.

When Chris Thaiss described "interactive language-rich technology techniques" as the "single biggest influence on ways we define writing and thinking about the curriculum and across the curriculum" ("Reliving"), the word *thinking* clearly paralleled *writing.* Thaiss also acknowledged the impact of distance learning on WAC, asserting that "in on-line curricula there's no escaping writing and no teacher thinks of it as an 'extra responsibility'" ("When WAC" 8). We also should recognize, however, that such time-intensive literacy instruction often does involve "extra" work for teachers, work that deserves appropriate recognition and compensation. Currently, the most interactive distance learning pedagogies are constructed around writing, reading, and responding, the responding element providing the socially constructed dynamic and student-centered learning that WAC/CAC/ECAC promotes. ECAC advocates can and should assume a leadership role in distance education projects to speak for communication-intensive communities of learners rather than a correspondence course model of distance learning.

In response to their members' concerns that teaching innovations in general and experimentation with new technologies in particular will interfere with and even damage promotion and tenure opportunities, professional organizations such as the College Art Association, the Conference on College Composition and Communication, and the Modern Language Association, among others, are drafting policy statements regarding ownership of electronic media, institutional support for the time-intensive training and development teachers need to use new media, and revision of promotion and tenure policies to reflect faculty innovations and contributions with new media. Academic conventions now feature sessions on the impact of technology on the discipline and on teaching the discipline. ECAC, we trust, will play an important role in changing many college cultures that devalue undergraduate teaching in the interest of encouraging research, publications, and grants.

Nobody can deny that information production and distribution has changed radically in the past decade now that most major publications put their archives online. After a little time online, people remember URLs as they do oft-dialed telephone numbers: even if they've never bought a book there, educators know

www.amazon.com; even if they've never taken the tour, they know about www.whitehouse.gov; if they're looking for academic jobs, they certainly know www.chronicle.com. And they know how to cut and paste and forward and download and file. Issues on how to cite sources, verify sources, copy sources, revise sources, and republish sources are all in the process of being negotiated for electronic media, and the media itself are changing much more rapidly than our laws and accepted publication practices. For example, the *Chronicle of Higher Education* reported that a "former University of Nebraska student has sued the university and a professor for posting on the Internet a personal essay the student had written in class several years earlier" ("Former U. of Nebraska Student"). What are the legal and ethical implications when a student or faculty member "publishes" a Web page or electronic portfolio on the college's Web site?

New technologies add new issues and exacerbate familiar challenges to WAC/CAC. Among these are the role of the professor—in particular, the talented lecturers in higher education reluctant to relinquish the stage to student collaborative projects, and also the teachers in professional fields obligated to prepare students for mastery of material that will meet the criteria of board certification exams. Not to be overlooked is the uncertain impact on promotion and tenure for faculty who invest time and energy in instructional innovations, nor the administrative mandate for larger classes. In the October 3, 1997, issue of the *Chronicle of Higher Education,* for example, the Information Technology section headlines read, "Rethinking the Role of the Professor in an Age of High-Tech Tools" and "Canadian University Promises It Won't Require Professors to Use Technology." Despite the potential of technology to foster the interaction that stimulates learning and prepares students for the contemporary workplace, Phil Agre, associate professor of communication at the University of California, San Diego, warns that "there will be an economic incentive to reduce the interactive components to reduce the labor cost" (Young, "Rethinking" A26). Thus, the struggle to integrate technology into instruction meets an economic reality: it is expensive. Further, the educational uses of technologies that promote active learning and the interactive development of communication abilities are more expensive than

those uses that offer only a one-way transfer of information. While administrators sometimes use technology to increase class sizes, outsource instruction, or increase the use of television, video, and computer packages in order to make institutions more efficient, proponents of quality over quantity continue to advocate for instruction that utilizes and emphasizes the higher-order communication and problem-solving skills that citizens, scholars, and workers need to succeed in this information age. Some chief academic officers clearly appreciate the Internet for its active learning capabilities. Despite reservations that "electronic communication will always lack critical elements of 'real' conversation," Neil L. Rudenstine, former president of Harvard, affirmed the power of "conversational learning" from online discussions and the opportunities for faculty and students to reconsider the teaching-learning process. He could have been an ECAC program director when he wrote that the Internet "calls upon the user to be active and engaged: following leads, distinguishing the substantial from the trivial, synthesizing insights drawn from different sources, formulating new questions. Seated before the computer, a student is challenged to make something happen, to act or pursue, rather than merely react or absorb" (A48). It is not the computer, of course, that challenges the student, but the computer-supported activity designed and guided by an instructor whose "prompts" lead students to fruitful inquiry, research, synthesis, and collaborative writing. Therefore, the professional development workshops that have characterized WAC/CAC for a quarter of a century must broaden to include ECAC as active learning with computer-mediated communication. As we demonstrate to teaching colleagues and administrators the potential for such learning, we provide an enlightened response to challengers such as Sven Birkerts and David Noble.

Thus, issues of access, intellectual property, budget and administration, and academic freedom are interrelated. With the advent of distance learning and online courses, who makes key decisions about whether to include a course in a college's online offerings? Or what the course will include? Or whether a course must be taught online? Or who will be able to enroll? Many teachers fear outside interference with course objectives and instructional methods for nonacademic reasons by enthusiastic

proponents of the new media or by administrators looking to cut budgets, or sell products, or win legislative support. They fear a college requirement that all course instructors must maintain a Web page, without first conducting an inquiry into whether all courses will benefit from such a tool. They question whether all students should be required to purchase a particular laptop computer. They fear that distance learning might be set up as skill-and-drill, an exercise in dissemination and regurgitation. They lament the megadollars and time and effort spent on technology that might better serve academic purposes such as smaller class sizes. And for such good reasons, we need to proceed with caution, but proceed nonetheless.

As we write this chapter, another educational commission has issued a national report: the Boyer Commission on Educating Undergraduates in the Research University's *Reinventing Undergraduate Education: A Blueprint for America's Research Universities.*[7] Among its ten recommendations are these four: remove barriers to interdisciplinary education, link communication skills and course work, use information technology creatively, and cultivate a sense of community. Hawisher and Selfe also suggest the way forward: "A major project for English teachers will be to develop a responsible professional vision—a vision grounded in sound composition theory and practice, and tempered by critical, informed, and humanistic perspectives on technology and reading" (312). Indeed, teachers across the curriculum might take on this responsibility through ECAC programs or committees. To accept such a responsibility, to be educational activists, WAC/CAC and ECAC faculty and program administrators can exercise wise and informed leadership for the electronic age on their campuses. And while the vision for each campus should be unique to that campus, we can see an outline for a national vision when we combine the list of faculty concerns with which this chapter began with the ECAC projects described throughout: communication, computers, active learning, collaboration, interdisciplinary, international, multicultural, across educational levels, interactive, reaching out to the public, reality-based, research into practice, adapting quickly to rapidly changing contexts. These issues are the basis of WAC/CAC/ECAC, key components of the evolving WAC vision since the 1970s, and a strong foundation

for significant cultural change in higher education in the twenty-first century.

Notes

1. The ECAC resources Web site—http://onlinelearning.tc.cc.va.us/faculty/tcreisd/projects/ecac/—lists many of these collaborations as well as WAC classic programs and gateways, WAC programs with an ECAC emphasis, and WAC/CAC programs and resources for computer-mediated communication across the curriculum. WAC now has its own online journal and resource, established in 1999 by Mike Palmquist of Colorado State University. *Academic.writing: Interdisciplinary Perspectives on Communication Across the Curriculum* takes advantage of the many communication options of electronic communication to publish refereed texts and hypertexts, links to WAC programs and publications online, columns about WAC and CAC activities, reviews of conferences of interest to WAC, reissues of out-of-print publications, and a new book first published entirely online.

2. Along with the current survey and report, previous surveys are linked to this site.

3. The terms "expressive" and "transactional" come from the work of James Britton et al., *The Development of Writing Abilities (11–18)*, London: Macmillan Education, 1975. We gratefully acknowledge their influence on our thinking, even though we realize they would probably quarrel with aspects of our chart.

4. See http://www.shsu.edu/~edu_paw/.

5. Check out the Educational Technologies at Missouri Web site at http://www.etatmo.missouri.edu/.

6. The Virginia Polytechnic Institute and State University (Virginia Tech) Instructional Development Initiative Web site is http://www.edtech.vt.edu/idi.html.

7. The full text of the Boyer report is online and available in print through the Web site: http://notes.cc.sunysb.edu/Pres/boyer.nsf.

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