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BASIC WRITING: CURRICULAR INTERACTIONS WITH NEW TECHNOLOGY

ABSTRACT: *Based on a survey of Basic Writing teachers across the country, this article reports a variety of ways in which developmental writing curricula have been changed by introduction of new technologies. The authors present findings related to classroom practice, teacher development, and distribution of resources. In Basic Writing and developmental writing sites, several general patterns of computer use emerge: resistance, lack of infrastructure, uneven access to professional development among staff (many of whom are temporary or part-time), and lack of visibility for successful efforts. In addition, isolated successes and imaginative implementations of emerging technology are reported.*

This essay surveys the interactions among Basic Writing students, Basic Writing curricula, and new technologies in higher education. We began the project with the goal of identifying curricular *transformations* which had occurred as a result of such interactions.[1] Rather than a single set of transformations, what we found in our survey was a landscape of basic writing instruction dotted with a variety of curricular transformations. Some of these involved new technologies. But it is not likely that these transformations occurred as a *result* of the technologies which are featured in them. Rather, it is more likely that several factors—the historical confluence of reform in Composition Studies, the availability of new, relatively inexpensive computer and networking technology, and Basic Writing's growth in sophistication over three decades of open-admissions—have sponsored a great deal of change in the writing curriculum for developmental students, change involving a variety of technologies and uses.

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DOI: 10.37514/JBW-J.1998.17.1.03

Background

The emergence of Basic Writing as an area within postsecondary developmental education is more or less coincidental with the rise of "computers and writing" as a branch of Composition Studies, so such interactions might have been expected. Indeed, both Basic Writing and computers-and-writing emerged as areas of study during the 1970s, at a time when the very nature of writing instruction was being transformed. In that period, the current-traditional paradigm and so-called "product" orientation were supplanted by a range of process pedagogies derived from social constructivist, cognitivist, and postmodernist strands in Composition theory and research (Crowley; Hawisher et al.).

Basic Writing expanded rapidly in response to the social demands for equal access to higher education following the civil rights movements of mid-century. New commitment to access led to new policies of open-admissions in many colleges and universities and resulted in the rapid expansion of open-admissions community colleges to accommodate large numbers of "new students" (Shaughnessy). These new students who entered higher education under open-admissions presented startling opportunities, frequently articulated as problems, for self-critical evaluation of habitual writing pedagogy and for rethinking the goals and content of the Composition curricula.

Research in teaching strategies for basic writing courses called into question the "current traditional paradigm" of Composition, as well as the formalist, belletristic dispositions which were at its center. The profession's examination of how we teach writing resulted in a new set of assumptions in Composition, which have in turn shaped Basic Writing. When the research was boiled down, Composition teachers saw that students across a broad spectrum of backgrounds, in a wide range of institutions, learn how to write best in teacher-directed workshops with structured opportunities for purposeful writing, response, and revision (Hillocks). This general trend in Composition's re-thinking of itself found a hospitable site in Basic Writing. The writing of previously excluded students, many of whom were unpracticed in what had been thought of as college writing, brought into focus the pedagogical flux and the vexing politics of Composition's paradigm shift. In one of her earliest essays, Mina Shaughnessy asserted that within Basic Writing there is an uneasy tension:

> The special conditions of the remedial situation, that is, the need to develop within a short time a style of writing and thinking and a background of cultural information that prepare the student to cope with academic work, create a distinctive ten-

> sion that almost defines the profession—a constant, uneasy hovering between the imperatives of format and freedom, convention and individuality, the practical and the ideal. Just where the boundaries between these claims are to be drawn in basic writing is by no means clear. ("Open Admissions" 152)

In positing that this tension "almost defines" the profession of basic writing, Shaughnessy was prescient, for the tension persists. From the earliest reflective practitioners associated with Shaughnessy and her colleagues at City University of New York, through a middle phase of scholarly and curricular "legitimacy" (Bartholomae & Petrosky), to post-colonial (Lu) and postmodern theorists (Sirc), the emphasis has been on individual students as writers, on their writing, on the cultural dynamics of privilege-and-language, and on situated instruction, with a view of the Basic Writing student as unpracticed and unskilled in composing specific forms of texts valorized traditionally by faculty. Basic Writing is marked, from the beginning, by a struggle between authentic expressionism and institutionally validated, constrained text production (Bartholomae; Stuckey). The tension remains unresolved.

Not surprisingly, within Computers and Writing has run a parallel version of the tension between authenticity and constraint to which Shaughnessy pointed. While introducing revolutionary technologies into Composition classrooms, writing teachers have struggled with the implications of their acts, as documented in any number of places, from the archives of the Alliance for Computers and Writing listserv (http://english.ttu.edu/acw/acw-l), to the history of computers and writing chronicled in detail by Hawisher, LeBlanc, Moran, and Selfe. A ready example is the way computers used in networked modes have been central to the promotion of social constructivist writing pedagogy and the emergence of new textual forms. The ways students write (alone? in groups? with face-to-face colleagues? with associates at a distance? from a linear outline? hypertextually? for a private audience? for a world-wide audience?) and what students write (history papers? riotgrrrrl hypertext sex-fem 'zines? course websites?) have been genuinely transformed in the networked setting. At the same time, early adopters of the networked technology which has been the vehicle for this revolution were naive, even quaint, in their expectations that the network would mediate familiar, traditional classroom decorum and controlled discourse (George; Kremers).

These tensions between the revolutionary and the conventional, arising from various uses of computers in writing courses, have been played out very dramatically in Basic Writing curricula. In his evaluation of the ENFI Consortium Project, for instance, David Bartholomae notes that "ENFI" class essays produced by basic writers at the University of Minnesota's open-admissions General College (written in a

local area network setting which was used heavily for on-line conversations and heuristic questioning) were more engaged, more authentic, and more intellectually vital than were the essays produced by basic writers at the same site in a more traditional classroom ("I'm Talking"). While Bartholomae notes the exciting dimensions of this "counterwriting," as he calls it, he is also quick to assert that some might see the writing produced by the ENFI Basic Writing students as "a threat to academic values." If anything, it appears, some uses of computers in Basic Writing classrooms simply amplify the tension Shaughnessy asserted to be so fundamental to the enterprise.

Yet not all applications of computers in the Basic Writing classroom cause such obvious ambivalence. For instance, Collins found that simple word processing improved the writing of college students with learning disabilities and reduced their writing apprehension. Computers have changed the way writing teachers imagine revision, and text-editing software has made it easier for unskilled or unpracticed writers to address a variety of errors in the surfaces of their texts. Now commonplace, such innovations were truly stunning for Basic Writing teachers and their students in the mid-1980s.

Access to higher education is the challenge to which development of Basic Writing has been, in part, a solution. But access to new technologies among students who are the most disenfranchised in the academy poses further problems. As we surveyed the ways in which basic writers, teachers of Basic Writing, and the Basic Writing curricula have been shaped, even transformed in the presence of new technologies, we were confronted by the simple fact that the dominant form of new, privileging technologies—the small personal computer and its connectivity—is not aggressively integrated at sites where Basic Writing instruction takes place most typically. In its 1996 Campus Computing Survey, for instance, the League for Innovation in the Community College found fairly low rates of access to and rewards for developing meaningful uses of technology in teaching. This is not surprising. Many of the obstacles to Basic Writing on campus are also obstacles to widespread innovation in the curriculum by way of computers. Building programs on the use of part-time and transient faculty, proficiency test-driven curricula which emphasize production of "safe" texts, constrained budgets, vexed institutional standing—all of the familiar forces which limit BW programs—likewise stand in the way of widespread investment in facilities, training, and institutional ecologies which might sponsor transformative practices in the Basic Writing curriculum mediated by strong uses of new technologies.

Yet we were surprised, even sometimes astounded, by the achievements of individual teachers and colleagues in departments who work in Basic Writing. As captured in detail at our searchable website <www.gen.umn.edu/research/currtran>, dozens of site-specific inno-

vations and transformative practices in basic writing courses are in place in a range of institutions around the country . (We invite your submissions to further this work.) Writing teachers in developmental education sites do not often have support for extensive evaluation and publication of their curricular innovations (Reynolds 3-4). As a consequence, much good work featuring uses of computers and related technology in the developmental writing classroom is realized locally but is not disseminated widely. But it should be. As Bruce argues, all innovation is *situated.* That is, a curricular approach or a theoretically derived pedagogy will be formed into a local practice as a result of the many-layered reality of the local situation. Whatever generally transforming directions might be discerned across Basic Writing sites where technology is embedded in the curriculum, these directions are realized one classroom at a time, one teacher at a time, in a thoroughly situated instance of Basic-Writing-using-technology. Surveyed below are such developments described in the literature, in syllabi on the web, in personal correspondence—in short, in sources both formal and fugitive. Taken together, they map the rich landscape we've surveyed.

Recent Research

In an early overview of computer-assisted instruction in the Basic Writing classroom, Lisa Gerrard observed that of all writers, basic writers are the most sensitive to the effects, both positive and negative, of computer technology. Although no single profile defines all basic writers, in general these students are inexperienced at writing and lack self-confidence as writers; in *Errors and Expectations,* Mina Shaughnessy suggested they be thought of as beginning rather than as poor writers. The basic writer's lack of self-confidence frequently manifests itself as an anxiety toward writing. When asked about their relationship to writing, these students often say, "I can't write" or "I hate to write." Research shows that, depending upon the ways in which computers are used in instruction, this technology can serve to alleviate or even transform a basic writer's anxiety about writing—or it can erode still further a basic writer's confidence.

Relative to the amount of published research about the use of computers in writing instruction, studies that are situated in developmental writing courses and/or focus on basic writers are sparse. And yet some of the most innovative uses of technology have been developed around basic writers. Bruce Horner reminds us that the discourse of Basic Writing, beginning with Shaughnessy, has cast the field as the "pedagogical West," a view that frees teachers to explore and experiment without losing their credibility. The Basic Writing classroom has been the site of much exploration and experimentation with technol-

ogy, some of which has been documented in the form of journal articles or conference papers or has emerged in the form of new software programs. Specialized listserv discussion groups provide a forum for basic writing instructors to share experiences and expertise. Much information, however, remains unpublished and/or undiscussed.

Both research and anecdotal evidence point to the positive effect of computers on students' attitudes toward writing, and a number of studies specifically focus on the segment of writers designated as developmental or basic. Pamela Gay reviewed eighteen studies conducted between 1984 and 1990 that examined some aspect of using computers in basic writing instruction. The most consistent thread running through the studies was the contention that word processing improves students' attitudes toward writing. Harder to measure were the ways in which writing on a word processor might affect the quality of a basic writer's work. While some researchers reported improvement, others did not, and still others reported mixed findings within the same study (gains in some areas, such as organization, and no progress in others, such as usage).

In search of explanations for such apparent contradictions, Gay looks beyond the results of each study to the instructional methods used by the writing teachers of the student-subjects. The wide range of assignments, lessons, and teaching approaches suggests to Gay that pedagogical practice and theory play a large role in research in this area, affecting not just how students interact with computers in the classroom but also what researchers measure as indicators of improved writing quality.

In a classroom study in which both the instructors and the basic writing students kept logs of interactions (student-teacher discussions about the piece of writing on the screen), D'Agostino and Varone revealed the impact these "in-process interventions" had on the student's writing. As they note, suggestions offered during the writing process are more likely to be acted on, or at least considered, than comments written on a paper after it is returned. Student logs also reminded the researchers that comments and suggestions are not always perceived by the student in the way the instructor intended, and that sometimes a teacher's comments serve to move the writer further away from, rather than nearer to, his or her intended meaning.

Since Gay's review of research on technology and the basic writer appeared, a few more research studies involving basic writers have been published. Batschelet and Woodson's study at the University of Texas at San Antonio was designed to measure the attitudes of basic writers toward writing on computers. Administering questionnaires to an experimental group of students that met in a computer classroom at least 50% of the time and to a control group of students that met in a traditional classroom the entire time, they found that the atti-

tudes of both groups of students toward writing—which ranged from ambivalent to negative—remained unchanged at the end of the course. Yet the responses of the students in the experimental group to a separate question about writing papers on a computer revealed a positive change in their attitudes. This discrepancy suggested to the researchers that students appeared to be making a distinction between two activities—the process of writing and their experiences of writing on a computer—which are fused in the minds of experienced writers. A similar study conducted with adult developmental writers (Hansman-Ferguson) seems to indicate that adult developmental writers, at least, *can* make the connection between activities; the researcher found that student apprehension about writing decreased after a semester in a computer-based writing course.

In a five-year study of students at Cincinnati University's University College (Meem), researchers compared the work and activities of students writing in traditional classroom settings, students writing on computers equipped with word processing programs (Bank Street Writer II), and students writing on computers equipped with both word-processing and thinking aid programs (Bank Street Writer II and Writer's Helper). While pre-test and post-test comparisons revealed no significant difference in the quality of writing among the three groups, students in the two groups using computers rated both the courses and the instructors significantly higher across the board in their end-of-course evaluations, conforming to the findings of earlier researchers.

One segment of students in the third group, however, did show remarkable improvement in writing quality, although this gain was not enough to make the overall group figures statistically significant. That segment consisted of adult non-traditional students who were placed in the University's Pre-Technology program. Interpreting the results of their study, the researchers speculated that access to Writer's Helper "eliminated the academic disadvantage suffered by most Pre-Technology students compared to their traditional counterparts" (66).

Meem's five-year study is unusual. Most empirical research available about developmental writing instruction in a computer environment has been conducted by researchers in their own classrooms over one or two terms only, ruling out the possibility of discovering any longitudinal effects. Because becoming a better writer takes time and practice, researchers have not been surprised when they couldn't document any statistically significant improvement in student writing after a ten- to fifteen-week computer-based writing course. Consistently, however, researchers have been able to identify changes in students attitudes toward writing, and this finding has been generally accepted as a first step toward subsequent writing improvement. Batchelet and Woodson's study serves as a reminder to those of us who teach devel-

opmental writers that part of our work involves modifying our students' conceptions of themselves as writers—we must help them find ways to integrate the reality of their newfound skills into their outdated self-images as poor writers.

Most writing teachers who advocate the use of computers in the classroom see ease of revision as one of the advantages of writing on a word-processor. Evelyn Posey's findings in a study of basic writers at the University of Texas at El Paso suggested that using computers to compose did not improve the quality of student writing, even though computer users did generate more drafts and share their writing more frequently than those who wrote with pen and paper. Posey challenged teachers to show students how to use the computer in revision so that it becomes more than merely a tool for word processing.

At least one experimental research study has documented improved quality in writing in basic writers. Cynthia Louise Walker's dissertation is based on data she collected in courses taught at East Texas State University. Her purpose was to determine if the revision activities of developmental students would improve (as measured both by quantity and depth of revisions) when revising on screen as opposed to on paper. She structured the study so that the same students would perform revision in both ways: one half of the students revised their first two papers on paper and their second two on screen, while the other half reversed the process. Student rough draft and final papers were scored holistically by independent scorers, and Walker compared the resulting scores. She found that revision on screen improved the paper's score in all but two cases. Students spent more time and more effort on these papers and developed a greater interest in them. They produced twice as many revisions on screen as they did when revising on paper, and their revisions included a greater proportion of meaning level changes.

Software and Networking Applications

Composing and revising on computers requires only "worldware," word processing programs such as WordPerfect or MS Word originally developed for office and home use, although many specific software programs have been developed to target these processes. As far back as 1979, writing teachers who were also becoming interested in computers were quick to see possibilities for their use in the writing classroom. Some of the teachers who had an elementary knowledge of programming used it to develop software to assist students at certain stages of the writing process.

Among these early programs was WANDAH, an acronym for Writing AND Author's Helper, developed in the early 1980s at UCLA

by Ruth Von Blum, Michael Cohen, and Lisa Gerrard. WANDAH (renamed HBJ Writer when commercially published) combined prewriting, word processing, and revision features and was used primarily in basic writing classes by students who, for the most part, had no prior experience with computers. Gerrard recalls that the program engaged the students to such an extent that they personified the computer while writing, addressing it, referring to it as her, and even, in one case, including WANDAH in a paper's acknowledgment (97).

Similarly, Writer's Helper evolved out of William Wresch's work with students at a junior college and the "lack of organization and development" he consistently saw in their writing (Hawisher et al. 45). Consequently, the first version of his software combined a group of prewriting programs with a tailormade word processing program and a set of programs to analyze their writing. Writer's Helper and its subsequent revision, Writer's Helper II, have been used extensively and with positive results in high school and college settings. Other prewriting programs developed by writing teachers include two by Helen Schwartz, SEEN and Organize, and Mimi Schwartz's Prewrite.

Writing and thinking aid software does present pitfalls for basic writers, whose insecurity as writers often makes them suspend their own judgment and conform rigidly to whatever rules the computer program presents, no matter what the situation (Gerrard). Yet, as James Strickland observes, "the computer allows teachers of writing to offer a variety of prewriting strategies at the time when most needed—during the composing process itself" (53). For writing aids to improve the quality of student writing, one study finds, they must be used with an element of "induced mindfulness"—that is, a deliberate sense of purpose that can be fostered by the teacher (Hicks). The technique used in this study consisted of instructing students to learn the features of the software well enough to be able to tutor others in the future.

Many learning centers contain tutorial programs designed to teach grammar, spelling, and punctuation, which students use at their own pace outside class time. When used by developmental writers, according to one study, these programs actually cause the number of student errors to increase (Downs and Linnehan). Further, "grammar tutorial programs can encourage disproportionate and premature concern with error correction" (Gerrard 100).

Gerrard's discussion of computers and basic writers, based on research published up to 1989, focused mainly on such tools as word-processing software, prewriting and revision aids, grammar tutorials, and style analyzers. Since then, both local area networks and the Internet have emerged as technologies with classroom application, and sophisticated software programs capitalizing on these and other newly available technologies continue to be developed.

The potential of local area networks for conducting discussions in writing classes was first recognized by Trent Batson, who termed the application ENFI (Electronic Networks for Interaction) and imported it into his classroom at Gallaudet University in 1985 as a way of enabling his deaf students to converse. Soon after, the software Realtime Writer (RTW) was developed to support this application, and the Daedalus Integrated Writing Environment (DIWE) also incorporated ENFI into its system as InterChange. DIWE, developed by graduate students in composition at the University of Texas at Austin in the late 1980s, was conceived of as an electronic workshop with features designed to facilitate writing and promote collaboration and sharing of texts. Similar in purpose and pedagogical approach is another software package, Aspects.

The benefits of using networked systems with basic writers have been variously enumerated in conference presentations and published articles. Typical of the advantages are those Ethel Russell observed using the Waterloo MacJanet Network in a community college setting: it provided a built-in sense of audience, changed the role of the instructor from evaluator to audience, enabled electronic exchange of messages and distribution of assignments, and enhanced subsequent student collaboration in a traditional classroom setting. Networked discussions also offer some students who have never found a voice in face-to-face discussions the opportunity to speak (Fey). Offsetting these findings are studies that bear a cautionary message, suggesting that sometimes synchronous conferencing, while promoting participation on the part of many students, may cause other students to be further silenced (Rickly; Romano).

Two other software packages, both designed by composition teachers, deserve mention as embodying the workshop approach to writing instruction. Norton Textra Connect, developed by Myron Tuman of the University of Alabama, supports the move toward courses conducted wholly online. The program's strength lies in its classroom management capabilities: instructors can distribute assignments or tailor them to specific student needs; students can exchange papers for peer feedback or post assignments to the network for discussion; instructors can collect assignments online and return them with comments and a grade, embedding optional links to an online handbook where desirable. Students do not have to learn elaborate rules for naming files and keeping assignments straight—the program does it for them.

CommonSpace, developed by Paul LeBlanc while he was teaching at Springfield College, focuses on shared reading and/or writing of texts by providing a multi-column interface. While a main text—a student paper, for instance, or the draft of an article—fills one column, the additional columns can be used for comments, peer feedback, and

even voice annotations. The software also contains chat and conferencing functions that can be used independently or in conjunction with the document on screen.

StorySpace, a nonlinear program developed by Michael Joyce, Jay Bolter, and John Smith, represents a completely different approach to writing. Joyce, a compositionist and novelist, was looking for a way to create interactive fiction, stories that change with each reading or reader. StorySpace enables writers to create a set of text spaces on screen—boxes that might contain single words, phrases, or whole paragraphs of text. The writer can manipulate them at any point, nesting boxes, clustering them in groups, and connecting any one box to another.

In addition to its use in creating hyperfiction, StorySpace has numerous applications in the writing classroom, as Martha Petry has found. She credits StorySpace with freeing her basic writers from "the tyranny of traditional print." For example, when she is working with students on revising a narrative paper, she turns to StorySpace as a new kind of brainstorming technique. Students use StorySpace to make boxes for attributes of an element of their paper, such as a person or place, and then write the corresponding details in each box. This process allows them to write as much text as they want without being hampered by where it will go; they can later import it selectively into their paper. Petry also finds it helpful to use StorySpace when generating ideas in a discussion, rather than listing ideas in a linear format.

Petry turns to StorySpace not only during writing instruction, but also when she want to model interactive reading processes. She types the first paragraph of an assigned reading into the computer, uses an LCD to display it, and begins reading aloud. With each word, phrase, or idea, she opens a box and asks a question of the students in the darkened room, typing their comments into the boxes as they call them out. In this way, students see what it means to interrupt the text as they read.

Since the mid-1990s, when the World Wide Web became readily accessible to most Internet users through net browsers (Mosaic, followed soon by Netscape and Internet Explorer), it has been viewed with interest by some compositionists. They see it variously as an enlarged audience for student writing (a means of making student writing public beyond the confines of the classroom), as a resource for both conducting research and teaching research techniques, or as a manifestation of an altogether different form of composition, one that uses images and sounds in addition to the written word for effective communication.

Jeffrey Maxson, who incorporated web page projects into one of his basic writing courses, offered the following rationale:

> First, students already possess expertise in understanding and interpreting images, sounds, both musical and otherwise, and video materials. They can in most instances be considered more expert than their teachers in the ways of popular cultural presentation. Secondly, many students, particularly those in the basic skills curriculum, are oriented toward the above means of information presentation much more than they are oriented towards text. . . . Hypermedia authorship can thus serve to introduce them to academic literacy through means with which they are familiar. In addition, it teaches them, through hands-on effort, the similarities and differences, the strengths and weaknesses of each of these modes of communication. Thirdly, these activities are intrinsically motivating, for all of the above reasons and because of the unique nature of the presentations students are able to produce.

His final point speaks to the academy's need as much as to the student's: "Basic writers in particular, by virtue of their not having been successful as students by traditional measures, are uniquely positioned to contribute to the re-visioning of academic literacy taking place with the introduction of new hypermedia communications technologies."

Nationwide Survey

To assess the extent to which composition teachers are using technology in their developmental writing courses—and to uncover some of the reasons others aren't using technology in the classroom—we conducted a nationwide survey of developmental writing teachers. These surveys were directed at instructors whose names had been supplied by administrators belonging to either the National Association of Developmental Education or to the League for Innovation. All of the respondents taught at community colleges or in developmental programs within universities or four-year colleges. Viewed as a whole, their responses indicate great disparity in use of technology, a disparity that does not always correlate to the type of institution. In the main, however, their responses reinforce the findings of the empirical studies cited above. The comments of respondents quoted in the sections to follow can all be found at the Curricular Transformation website at <www.gen.umn.edu/research/currtran>.

Kinds of Technology in Use

For some of the writing teachers in this survey, the presence of a

lab on campus where students are able to word-process their papers was the closest connection they could make between computers and writing. Having access to a computer lab in which to hold class periodically was a high priority on their wish lists. Other respondents taught in networked computer classrooms with an Internet connection, enabling them to make use of e-mail and the World-Wide Web in their pedagogies. To these seasoned users, the idea of computers as word-processing tools was such a given that it was not even worthy of mention. They were already looking forward to technology that is beginning to emerge from the development stage, such as CUCME (see you, see me) video conferencing.

The most prevalent kind of technology identified on the surveys was the computer, whether part of a fully-equipped writing classroom or off somewhere—usually in inadequate numbers—in a learning lab, department lab, or campus lab. The software available on these computers ranged from the minimal word processing package (several respondents mentioned world-ware programs such as PFS Write, WordPerfect, and MS Word) to grammar and mechanics checking programs (e.g., Grammatik) to tutorial programs such as SkillsBank or Invest. Diagnostic and placement software was also mentioned frequently. Two respondents specifically mentioned software packages (MS Office, WordPerfect Works and Microsoft Works) that enable students to integrate graphics into their writing assignments and oral presentations.

Three software packages developed specifically to support the workshop approach to writing instruction were also mentioned. The Daedalus Integrated Writing Environment features Interchange, an electronic discussion forum, along with a series of invent and respond prompts, a word processing program, and a bibliography preparation tool. CommonSpace supports peer editing by enabling students to comment on each other's papers in separate columns that run alongside the text column. Norton Connect is a system in which students can share their work electronically with others, turn it into the instructor electronically, and follow links to sections of a grammar or style manual that can be imbedded in the instructor's feedback.

Relative to the number of responses that named hardware and resident software as instructional tools, significantly fewer respondents mentioned Internet-related technologies as items in their pedagogical bookbags. This figure, under ten percent, most likely reflects the proportion of developmental education programs with equipment that provides Internet access. Of those who did mention the Internet connection, e-mail was cited most often, both in terms of its ability to facilitate communication among students and between student and instructor. In a few cases, students hand their papers in via e-mail. Larry Silverman at Seattle Central Community College uses e-mail to match

his students up with students in other states and even countries: "I've had my developmental writing class correspond with students in Hawaii, and next quarter they will correspond with a group of students in Japan." To find these classes, he advertises on a listserv designed to make these connections.

Some writing teachers on campuses with access to the World Wide Web use it as a way to teach research techniques and a place to conduct research and gather information. One respondent makes full use of the Internet and World Wide Web technologies, posting his syllabus to the web and using an e-mail distribution list to assign homework. He has students post their comments about reading assignments to a class listserv and initiates them in the use of a MOO (a virtual meeting place) so he can hold class even on those days when he can't be in the room.

Two respondents listed CD-ROMs among the technologies available to their students. A teacher in adult education uses *Grolier's Encyclopedia* on CD as a text for writing: "The database set-up allows students to access all kinds of information. They then write anything from research papers to outlines to summaries."

Devices for projecting images onto large screens for all students to view are a staple of instruction in the writing classroom. The overhead projector enabled teachers to create transparencies for use in lecture situations or as a means of displaying examples and supplanted the need to laboriously write out such information ahead of time on the chalkboard or reproduce multiple copies for students. The development of liquid crystal display panels (LCDs) and computer projectors that plug directly into a computer's central processing unit has added a dynamic quality to this instructional tool. A handful of respondents reported having access to LCDs or computer projectors, either as part of the basic classroom equipment or available on a cart for checkout.

Jack Sexton of Paradise Valley Community College, part of the Maricopa Community College District, puts the LCD to multiple uses in his writing classroom. To teach editing skills, he might put a student paper on the screen and ask students as a group to discuss possible revisions, keying in changes as the students agree on them. For a lesson on thesis statements, he will ask students to type their thesis statements into a common file at the beginning of the class period and then work through them, one by one, so that everyone has access to all of the examples.

In short, the use of computers in instruction ranged from computer-aided instruction (CAI), exemplified by tutorial programs, to computer-assisted composition (CAC), where students did much of their composing at the keyboard, to computer-mediated communication (CMC), where the emphasis was on electronic communication

using software packages such as Daedalus InterChange and Norton Connect and technologies such as computerized projectors, e-mail, and the World Wide Web.

Impact of Technology on Teaching and Learning

Basic Writing instructors who have introduced elements of technology into their courses are mixed in their evaluation of its impact on student learning. While one instructor states that he has not found technology to improve student writing ("I believe computers are basically a gimmick"), another asserts that technology has made his an entirely different course that has resulted in more literate students.

Responses tend, not surprisingly, to cluster around other factors, such as the level of commitment a department or institution has made in hardware, software, and training. The instructor who stated he saw no improvement in writing, for instance, teaches in a department with access to a "room with computers," no training, and little technical support, while the instructor who felt that teaching with technology was producing more literate students teaches at an institution that provides workshops to train faculty in new forms of technology and has access to the Internet and the World Wide Web, as do his students. Cause and effect is difficult to sort out in these situations.

Whether they were making use of the computer to deliver computer-aided instruction in a venue outside the classroom, such as a writing or academic resource center, or using the computer as a writing tool, holding class sessions in the computer lab or a computer classroom, instructors reported largely similar results. The positive evaluations of using technology overwhelmingly outweighed the neutral or negative ones, and the rewards noted by instructors fall naturally into four groups: positive impact on students' attitudes toward writing; improved appearance of papers; improved student writing, in terms of both quantity and quality; and an increase in efficiency on the part of the instructor.

Again and again, instructors noted that working on computers has positively altered students' attitudes in their writing classes. "Using technology has made the basic English requirements more interesting and relevant for vo-tech students," observed one respondent. In related observations, other instructors stated that students see the computer as a useful tool and feel they are learning the technology of the future when they work on a computer. Instructors variously reported that students have more confidence in their writing when using the lab and develop self-esteem by working at their own pace to accomplish writing tasks. Among other reasons cited: students respond well to computer-based instruction; working on a computer provides

variety and adds interest; computer-related assignments increase student involvement in their own educations.

Simply turning in word-processed papers, instead of the often illegibly handwritten ones, was noted by some instructors as a positive change brought about by technology. Most often, however, instructors saw this "improvement" as benefiting themselves as much as the student. Yes, word-processed papers are a "neat end product," as one teacher put it, presumably offering satisfaction to the student upon completion, but even more to the point, they are easier to read and make writing teachers' time more productive.

By far the most frequently cited examples of ways in which using technology had had an impact on developmental writing courses were outcome-based and revolved around both the process and products of student writing. The ease with which documents can be changed has significantly affected the amount of revision that is taking place. Teachers can insist on revision and editing if they choose; students are more likely to exercise some editing and revision strategies on their own work with or without pressure from their instructor. Spelling checkers not only help to eliminate surface errors in final drafts, but their mere existence encourages some writers to try words they aren't sure they can spell, knowing they'll be able to correct them in a later draft. Students just plain write more—more words, more pages, more drafts. And teachers say they are able to fit more writing assignments into a term because computers speed up the editing and revision processes.

There were some contradictions in what writing instructors had to say. One asserted that meeting in a computer lab changed the structure of the class so that more time was spent writing and less on grammar lectures or demonstration. For another, meeting in a computer lab required the instructor to spend more time teaching word-processing and computer skills and less time on writing instruction. No doubt both are true.

Whereas most of the successes cited were student-related, the majority of the problems mentioned by instructors were institutional in nature. Lack of funding for adequate equipment was the biggest issue: not enough computers to serve all students in a class, outdated hardware that doesn't support new software, hardware and software that doesn't perform as promised. Insufficient faculty training (or none at all) and not enough technical support were also seen as roadblocks to increased use of computers in developmental writing courses. Instructors reported problems with specific software as well as general system malfunctions and breakdowns. One respondent specifically mentioned that the administration is supportive of technology in the classroom—for the engineering and science departments. Convincing them that the writing program should receive the same level of fund-

ing has been a greater effort.

The fact that students arrive in writing classes with minimal or no computer skills is perceived by almost all instructors as a problem, as they are required to show students how to use the machines before they can ask them to work on writing assignments. Most agreed that while this lack of computer experience does create a problem in the beginning, it disappears as students become more familiar with the hardware and software. Almost all instructors surveyed agreed that students offer little if any resistance to technology. Several noted that anxiety seems to be age-related and that returning students, who are usually older, are most prone to it. Even their fears, however, dissipate quickly.

Some students, however, lack keyboarding, or typing, skills, which is a decided disadvantage. "A small handful of students," noted one instructor, "refuse to even hunt and peck on the keyboard, get frustrated, and fall way behind." Should knowledge of word-processing be a requirement for entry into a basic writing course? At one college, the instructor who teaches word-processing thinks it should and wants students to take his class first. Only one instructor reported that students use technology as an excuse for not completing assignments on time, saying, for instance, that they couldn't get to the lab.

Perhaps because these surveys were sent to people who had been recommended by administrators at their institutions as teachers who were using technology as part of their developmental writing courses, many of the instructors who responded to the survey complained of not having colleagues who were similarly involved. These people became the sole instructors taking students into the computer lab or lobbying for more equipment; their colleagues were often reluctant to get their feet wet, for any number of reasons, including technophobia.

Faculty Training

In cases in which the instructor is the department technology expert or the only teacher to be using computers in writing instruction, he or she has usually been propelled by a personal interest in computers and has been self-taught. One person wrote of "sitting in the basement computer lab until 4 a.m. until I figured this stuff out." These people consulted manuals, called helplines, and learned by trial and error. Many of them credited other people—colleagues, computer science department staff members, patient friends, and others, such as secretarial staff members, who were already using the particular hardware or software.

Some teachers were first introduced to ways that computers could enhance writing instruction in graduate school or at conferences or

workshops put on by professional organizations such as the Conference on College Composition and Communication (CCCC) and the National Association for Developmental Education (NADE), and by federally funded or privately funded organizations such as the National Endowment for the Humanities and the Epiphany Project. Epiphany, a project funded for two years by Annenberg/CPB in collaboration with the American Association for Higher Education and the Alliance for Computers and Writing and now continuing as a nonprofit organization, conducts three-day intensive institutes around the country to introduce teachers to pedagogies involved in using computers in writing instruction. Interestingly, among its recommendations is that schools send people in teams of two or more, a strategy that provides synergy when participants return to their own institution and helps to eliminate the sense of isolation reflected in many of the completed surveys received.

As evidenced in the responses, some colleges are providing training for their writing faculty. It is often the early adopters—those instructors who discovered technology on their own—who end up organizing workshops to teach others in their departments or institutions. Some instructors reported attending workshops offered at the institutional or district level, and a few reported that their institutions have instructional technology committees. Still, the profile is uneven. Many instructors who have integrated some technology into their courses report that they do not even have computers in their offices, and many more report that their institutions have not yet geared up to provide access to e-mail for faculty members, much less students.

Visions of the Future

The great disparity among the levels of technology currently in place across the country in colleges and universities with developmental education programs means that individual and departmental goals for the implementation of technology in writing instruction also vary widely. One teacher's dream is in effect another teacher's reality. Some instructors long for more equipment, better computer classrooms, or networking capabilities, while others have all that and simply want more time in which to explore these tools or develop assignments around them. Still others envision kinds of technology or software programs that have yet to be developed. A lone voice expressed the sentiment that "we would be satisfied if the student just came every day with paper, pencils and pen, and textbook."

No matter what may be the vision of implementing technology, pervasive in the responses are indications of writing pedagogies that these technologies support. At either end of the spectrum are teachers

who believe that a collaborative environment leads to learning. The instructor who reports that her college encourages its faculty members to get training in multimedia still forthrightly states, "I don't see much use for multimedia in basic writing. . . . I rely heavily on the photocopier and chalkboard. I type worksheets based on students' writing and duplicate them for class members to discuss. We do a great deal of collaborative work." Her counterpart in another college has a different way of facilitating collaboration—by using the computer projector to display samples of student text to be discussed. These two technologies, the former far more labor-intensive for the instructor, fulfill the same purpose in the writing classroom, allowing students to see writing as a dynamic process and one in which the effective communication of ideas is paramount.

Another principle underlying the workshop approach to writing is that of writing for an audience other than the teacher, whether that means one's classmates or the portion of the world funneled through the World Wide Web. Those respondents whose students use e-mail to conduct a text-based conversation with students elsewhere or who post their papers to the Web quickly develop, in the words of one respondent, "a sense of what their readers need to understand the texts they produce."

The approach to developmental writing instruction that emphasizes the mastery of discrete skills is also very much in evidence in these responses. Despite the existence of research that suggests that grammar tutorials, style analyzers, and other tutorial programs are detrimental to developmental writers, many writing instructors continue to rely on them. Without polarizing writing instruction pedagogies as either product or process, repeated comments that focus on appearance of text (e.g., "a neat end product") or promote excessive dependence on style checkers nonetheless suggest that technology is sometimes being used to reinforce, perhaps unwittingly, a product-oriented view of writing.

When instructors were asked to comment on what their writing courses will be like in the future, most conceived of courses along the lines of current models but enhanced by more and better hardware and software. Only a few people considered that future writing instruction might undergo a total transformation in form while still grounded in the same theory. Several respondents suggested that their classes might be offered in an electronic format—over the web or Internet—and one envisioned an interactive CD-ROM teaching module, but then noted that "the institutional pedagogy is moving away from any individualized learning, so whatever it is, it better be communal!"

Issues and Policies

Whether in their capacity to foster collaborative learning, enrich opportunities for student research, encourage students to write longer papers of a higher quality, or simply modify students' negative attitudes toward writing, computers have already made an incalculable impact on the field of writing instruction. As the results of our survey have shown, however, only a fraction of developmental writing teachers are in a position to incorporate technology into their courses to the extent that they would like. They are stopped by factors both economical and political: lack of support for technology at the department or institutional level (as manifested in funds for equipment, space that has been retrofitted with the appropriate wiring, and technical support), and lack of clout within the department for access to the computer facilities that do exist.

Faculty training has emerged as another roadblock, since many of the people who teach developmental or Basic Writing courses carry heavy courseloads that cannot accommodate time-outs for training without compensatory release time. To compound the problem, many departments employ adjunct or part-time faculty to teach their developmental writing courses; even if training sessions are offered, these instructors cannot always be available to attend them. To ensure that access to technology does not become a factor dividing institution from institution, department from department, and ultimately student from student, those of us *with* access must find ways to eliminate the impediments in the paths of those *without* access.

These obstacles, which occur not just in Basic Writing sites but also in Composition departments (which in turn are often situated in English departments), are topics of frequent discussion on listserv groups devoted to issues of writing pedagogy or technology in higher education. Such discussion groups have created virtual communities of teachers and administrators with like interests and goals who often pool their experiences and expertise to address problems presented to them. Need recommendations from users to bolster your request to purchase a new kind of writing instruction software? Go online. Need suggestions for the most effective layout for a computer classroom? Go online. Need data to convince a hesitant chair that the expense of a computer classroom is warranted? Go online. Many of the respondents to our survey remarked that, as the resident "expert," they felt isolated at their institutions; listservs provide them with the chance to develop virtual colleagues.

While listserv discussion groups represent informal sites for sharing information, websites (including the website developed by this

project and the many web resources linked to it) are more formal sites for the sharing of information about writing pedagogy and technology. Such websites can be productive as entry-level places to learn about everything from terminology to available technologies; they can also act as information exchange sites and clearinghouses to put inexperienced technology users in touch with experienced teachers at nearby institutions.

Sending a group of Basic Writing faculty members to conferences and workshops to learn about new uses of technology is an expense beyond the budget of most departments. The trend toward cyber-conferences and satellite conferences responds to this situation by bringing the workshop or the conference to faculty members who may have neither the time nor the financial support to travel. Electronic conferences, or cyber- conferences, can either occur asynchronously (a highly regulated form of listserv discussion), or they can take place synchronously in a MOO. Satellite conferences, in which presenters are projected live onscreen in an auditorium setting, can be particularly affordable if the conference costs are being shared by several institutions simultaneously.

In addition to providing a place for new users to learn about technology, cyber sites (e.g., listservs, websites, electronic conferences) provide a way to capture what we earlier termed fugitive information: classroom practices that do not appear in traditional print sources. The innovative work of so many instructors with part-time status and heavy courseloads goes unpublished and thus remains hidden to all but their immediate colleagues. Searchable websites such as ours, where these teachers can post lessons developed around specific technologies, will augment the amount of information available and provide a more realistic picture of how technology is being used to enhance Basic Writing pedagogy. Taken together, all of these efforts—emerging communities of support, online collection and dissemination of information, and electronic venues for training—represent an initial step in lessening the disparity between the kinds of technology available to basic writers in learning institutions throughout the nation.

Note

1. The authors gratefully acknowledge the support of the Annenberg/CPB Projects Initiative II and the General College Center for Research of Developmental Education and Urban Literacy, which funded *Curricular Transformation and Technology in Developmental Education*, a cross-disciplinary collaboration at the University of Minnesota.

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