

# Assessing Computers for Writing: Stepping Back to Move Forward

BY STEPHEN MARCUS

In our professional lives, we are often looking for simple answers to complex questions. Particularly in areas of relatively new research, such as the potential of technology for improved literacy instruction, it can be difficult to arrive at definitive conclusions. For instance, all of us want to know:

## **“Do word processors improve writing skills?”**

Research on improving writing with computers tends toward the same extremes as study in other areas concerned with the teaching of writing. At one extreme, the computer-related research is like crashing through an open door: “Our one-year, \$75,000 study suggests that computers may have some affect on kids’ writing.” At another extreme, the focus of the research may be so narrow as to be virtually irrelevant to the actual teaching of writing— sort of like walking into a closed door: “Our keystroke-catcher analysis of the writing revision software protocol suggests that the backspace/spacebar ratio is inversely proportional to the physical dimensions of the disk on which the paper is stored, at the .05 level of statistical significance.”

These fictional but factually-based examples may be extreme, but extreme studies on word processing that offer little or no practical insight for writing teachers are commonly found in the professional literature. This shouldn’t be surprising, however, since theories and methods for studying the acquisition and use of writing skills are themselves still in the developmental stage. So when we add a complicated intervening variable, the computer, we

have a particularly complex “event.” It’s little wonder that researchers have trouble carrying out studies that are rigorous, yet provide truly thought-provoking data.

## **“Ok, but does word processing improve writing skills?”**

There is no shortage of anecdotal evidence. Such reports have, in fact, been a major factor in fueling the enthusiasm for computer use in writing. People work with word processors. They undergo minor to major transformations in their experience of themselves as writers. They report these changes to their friends, and they want to share them with their students. And so it goes.

Unfortunately (even if understandably), site administrators as well as those with district and state-level responsibilities, under pressure to make major capital expenditures for equipment and software, would like some harder evidence that the reportedly magical properties of the technology are not mere illusions or the products of good intentions or wishful thinking. Fortunately, regular readers of professional publications will find ample support for their experience and intuition concerning the value of technology in relation to writing instruction. Numerous books devoted to this topic have been published by NCTE, Heinemann-Boynton/Cook, Intellect Press, Open University Press and others. These texts have provided an ongoing account of researchers’ efforts to establish with some experimental rigor the efficacy and advantage of using technology to promote instruction. Of course, those who remain skeptical—and those whose unbridled enthusiasm needs tempering—

can also find abundant cautionary notes, often in the same sources or in discussions like Jane Healy’s *Endangered Minds* (Simon & Schuster, 1998), which suggests at one point a distinction between computer-mediated efforts and “real reading and writing.”

In examining reports from both sides, however, readers need to remind themselves that sometimes the hidden criterion for what constitutes “hard data” is merely that it’s “data that supports my point of view...that other stuff is anecdotal or procedurally flawed.”

## **“So...does word processing improve writing skills?”**

While at Stanford University’s Institute for Communication Research, William Paisley and Milton Chen asked some very astute questions about efforts to study the technology (“Children and Electronic Text,” NIE Study, 1982). In part, they wanted to know whether research questions were being asked at the time of the students’ initial or later use of the technology and whether the technology itself was in its early or mature stage of development. We could add the question of whether the methods for *teaching* the technology are in their early or later stage of development.

The contributing authors to Paisley and Chen’s later work (*Children and Microcomputers*, Sage 1985) provided important theoretical and research models, and the editors observed that “we are learning to describe and classify the relevant social phenomena,” adding the cautionary note that “our thinking is not yet systematic or capable of deriving general principles...we need more experience.”

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Studies over the intervening years addressing the question of whether word processing improves writing skills would appear to have received ample, varied, and in-depth examination. Appearances, however, can be deceiving, since it is often the case that “believing is seeing,” that is, that one’s preconceptions, biases, and agendas can significantly influence what one accepts as visible, even through a supposedly scientific lens (see, for example, R. Picard, *Affective Computing*, MIT Press, 1999).

In the study of word processing and writing, rigorous research is confounded by the rapid change in the technology itself and the vested interests people develop toward the use of one word processor or another. Discovering the true potential of computers is also hampered by the relative lack of development of instructional

strategies for teaching word processing. For example, word processing instruction is often limited to teaching little more than “delete” and “save.” Specialized search-and-replace procedures, as well as other advanced techniques that are potentially helpful in revision, are rarely taught. In fact, most teachers fall within the parameters of the 80/20 Rule for Technology, a rule of thumb that suggests that 80% of the people using a particular technology (hardware or software) make use of only 20% of its power or features. Since we can only teach what we know, and we only know what we use, and we only use a small subset of the tools word processors offer for writers, much of the potential of word processors for improving students’ writing and revision remains unused, unknown and untaught.

And to further muddy the waters, word processing is no longer one context-independent skill: researchers must tease apart different word processing techniques and technologies used in different environments: word processing in general, word processing for the Web, for e-mail, for news groups, for MOOs, MUDs, and other virtual communities, and for hypertext environments created with applications like HyperStudio and HyperCard.

Steven Gilbert and Richard Green further complicate the question by adding another variable. They place the question in the context of a cost/benefit analysis. The question itself, they say, may be “more difficult and costly to measure than is warranted by the declining costs of providing the service” (*Change*, May/June 1986). To summarize their argument all too briefly, in situations where the technology is being used for a variety of purposes (e.g. basic computer literacy and software applications training, instruction in a variety of disciplines, laboratory and simulation courses, data analysis and other research related projects, journalism and other design and production projects, etc.), it’s getting harder and harder to determine exactly what proportion of those costs should be attributed to word processing and writing instruction *per se*, and no matter how you apportion them, prorated costs are dropping rapidly. The authors’ analyses of costs, benefits, and penalties (for poorly thought-out and implemented use of technology) are particularly relevant for anyone considering whether it is “worth it” to devote financial resources to using technology to improve writing.

### “Could you repeat the question?”

Word processing technology is still evolving and is still fairly primitive. Methods for teaching the technology, and questions about how and whether it should be incorporated into the language arts curriculum, are still matters of intense debate. For many, this question needs to be considered in the context of how and when. For example, there are vast and often vitriolic differences of opinion regarding how old children should be before they are introduced to computers. The distinctions between “teaching word processing” and “teaching writing using word processing” are regularly lost, or not even considered, in many computer courses. Controversies over the use of grammar, style, and spelling checkers continue to rage, often fueled by the particular (dis)abilities of the software available for such tasks.

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Focused attention on what we are doing and how we are doing it is an important stage in setting goals and planning change. However, if the past is of any use in predicting the future, we can be fairly sure that advances in the technology itself will continually outstrip our understanding of what to make of it, what to do with it—and how much to pay for it.

Research, even of the open- and closed-door varieties, often enriches the researcher more than the reader. For teachers with an interest in conducting their own classroom-based exploration — that is, those who want to “research” rather than just use the technology — there remain some rather straightforward goals: Ask not what word processors can do for your students; ask what your students can do with their word processors. Learn from your students and for yourself what the technology can and cannot do, how it is changing their habits and attitudes. This is one nice way of getting them to think about their own composing process: what it used to be, what it is, what it could be like.

### “Does word processing improve writing skills?” I’m glad you asked.

Ask your students. And see if they can prove it.

### Oh ... You Meant Writing Scores Not Skills

There is an understandable penchant for demanding “hard data” to support one pedagogical approach or another, particularly when ideologies, significant expenditures, careers, reputations, and legacies are at stake. What is acceptable as “hard” data seems to depend as often as not on a mix of such volatile factors.

In the area of technology-involved writing instruction, there are those stakeholders—some parents, school board members, administrators, legislators—who look to standardized achievement test scores as the sole significant measure of effectiveness. Others—like *other* parents, instructional specialists, administrators, and community

### 7 Ways to Ensure a Computer Lab Doesn’t Improve Writing Instruction

Here are some sure-fire methods—based on real-world examples—for getting less than you bargained for.

1. Have learning about the computer or the software itself become the focus of lab instruction—rather than using the lab to teach writing.
2. Make sure that teachers relinquish responsibility for what their students are learning in the lab.
3. Make it difficult for teachers to schedule the lab and for students to use it.
4. Make sure there aren’t enough printers, so students have to wait...and wait...and wait...to get their work printed out.
5. Put the lab in the hands of someone who already has too much to do.
6. Don’t train the teachers to use the lab.
7. Don’t budget for staff development or software.

If you find too many of the “guidelines” noted above being followed at a site you’re planning or scrutinizing, you might just remind everyone of writer Kurt Vonnegut’s suggestion that “A step backward, when you’re headed in the wrong directions, is a step forward.” People shouldn’t be afraid to change their minds and to change their direction.

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leaders—embrace a wider array of indicators as defining the scope and effectiveness of what characterizes effective writing instruction and a skillful and successful writer. They often look to increased attendance and time-on-task, reduced absenteeism, better attitudes toward teachers and school, increased willingness to engage in writing-related tasks (in and out of school), their own examination of students' portfolios, and other such factors as significant indicators of improved instruction.

Hard-data seekers of either type can log onto the Web site established for the City University of New York's recent Forum on "Student Learning and Technology: Assessing the Impact" ([www.nettech.org/forum](http://www.nettech.org/forum)), where are posted many particularly apposite references and resources related to assessing the computer's impact on students' learning to write—and writing to learn. I've provided below a few that sample the array of hard data and hard looks at the field.

- "Writing is the one area where deep and sustained access to technology makes a difference. At the 7th, 8th, and 9th grade levels, Explore students do significantly better than their non-Explore peers on the writing portion of state tests." *The Union City Story: Education Reform and Technology / Students' Performance on Standardized Tests* (April 1998). Education Development Center (96 Morton Street, New York, NY 10014, 212-807-4200).

- "[L]arge scale assessments of writing, at state, national and even international

levels, are attempting to estimate students' writing skills by having them use paper-and-pencil. Our results, if generalizable, suggest that for students accustomed to writing on computer for only a year or two, such estimates of student writing abilities based on responses written by hand may be substantial underestimates of their abilities to write when using a computer." "Testing Writing on Computers," M. Russell and W Haney. Education Policy Analysis Archives (Jan 15, 1997). College of Education, Arizona State University, Tempe, AZ 85287 <<http://olam.ed.asu.edu/epaa>>

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- "[T]his was one of the largest and deepest studies ever done on the effects of educational technology, and we have an exhaustive amount of data—quantitative, qualitative, and longitudinal—in addition to the anecdotal reports. Everything points to the same conclusion—that increased technology supports, facilitates, and encourages student achievement. The gains reach across schools and districts with different education policies and sociodemographic backgrounds." "Technology and Achievement," D. Mann and E. A. Shafer. *The American School Board Journal*, July 1997 (or Mohawk Regional Information Center, 313-361-5530).

- "Student writing [is] a key goal for technology integration." (Boulder Valley, CO). "The district adopted a strong focus on writing and using the technology as a tool to facilitate the writing process." (Scott County, KY). National Study Tour of District Technology Integration (December 1996). Education Development Center (96 Morton Street, New York, NY 10014, 212-807-4200).

- "Improvements in writing have been seen in [these and] other projects where computers are generally available at home and in school, and are usually associated with changes in teaching that accompany improved facility to revise and efforts to incorporate process writing approaches." Anytime Anywhere Learning Project; The Buddy Project. Rockman *ET AL*, 605 Market Street, #305, San Francisco, CA 94105 <[www.rockman.com](http://www.rockman.com)>

- "If computing costs are low enough, and if the benefits are easy enough to observe, then expensive, elaborate evaluations become unnecessary for fundamental campus decisions. By the same token, if the potential cost of a single application of the technology is so low, and the benefit of that application is so great, formal evaluation may be unnecessary... As the cost of machines continues to decline, *word processing alone* (authors' emphasis) will soon justify computing capability for every student, faculty member, and most administrators." "New Computing," S. W. Gilbert and K. C. Green. *Change* (May/June 1986).



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An examination of any of the references above will suggest, as noted at the start of this discussion, that successful use of technology for teaching and learning writing depends on “multiple converging determinants.” John Cradler (Educational Support Systems (cradler@earthlink.net) has provided a useful “Inventory of Conditions for Effective Technology Use,” designed to assess the extent to which conditions are present that make possible the optimal use and impact of technology in teaching and learning from the classroom to the school district level. Noting that “the impact of technology [is] largely a function of factors other than the technology itself,” Cradler has provided a handy tool for gaining perspectives on why certain projects (e.g., those cited above) seem to flourish more than others.

Here are the major categories of the Inventory:

- Local commitment to innovation and change.
- Characteristics of school governance and leadership.
- Curriculum and performance standards.
- Coordination and integration with other programs.
- Staff development and technical assistance.
- Technology utilization.
- Courseware and online resources.
- Access to technology.

- Administrative support
- Community involvement.
- Assessment and evaluation.

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The assumption, based on the extant literature, is that such factors are significant components that “when taken together maximize the contributions technology can make to improving teaching and learning” of writing.

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ing) into a composing process *environment*, one that is accessible, practical, and for more and more students, affordable. The technology itself can fruitfully be considered both as figure and ground, as classroom denizen and ecosystem, perhaps as particle and wave. Assessing its impact—on both students and educators—promises to remain as interesting and challenging in the future as it has been in the past.

What do we know about the impact of technology on student writing? What happens when we try to integrate technology into teaching and learning?

This article is, admittedly and unavoidably, a deeply superficial discussion of some of the background, issues, and determinants that respond to—if not exactly answer—these core questions. Its intention is to suggest some directions and resources for exploration by full-time researchers and part-time teacher-researchers.

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