DOCUMENT RESUME

ED 452 493 CS 014 353

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TITLE How Can We Assess Computer-Assisted Reading and Writing Instruction?
PUB DATE 2000-11-00
NOTE 17p.; Paper presented at the Annual Meeting of the National Writing Centers Association (5th, Baltimore, MD, November 2-4, 2000).
PUB TYPE Opinion Papers (120) -- Speeches/Meeting Papers (150)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Computer Assisted Instruction; *Computer Software Evaluation; *Computer Software Selection; *Courseware; Evaluation Methods; Higher Education; *Reading Instruction; *Writing Instruction; Writing Laboratories
IDENTIFIERS Electronic Resources

ABSTRACT

This paper addresses the lack of evaluative resources for computer-assisted reading and writing instruction (CARWI). It begins by discussing the benefits, drawbacks, and effectiveness of computer-based instruction. It then describes types of CARWI packages, including: (1) writing process software; (2) electronic handbooks; (3) interactive exercises; (4) comprehensive language programs; and (5) online writing labs (OWLs) and online reading labs. It continues by discussing cost, convenience, attractiveness, and effectiveness, which are the factors to consider when selecting CARWI programs. It then describes two Web sites developed by the author to solicit and post descriptions and user testimonials of software packages used in writing centers nationally. The author also suggests a numeric rating method to evaluate the results of such questionnaires and concludes by discussing the advantages of CARWI. (EF)

How Can We Assess Computer-Assisted Reading and Writing Instruction?

by Helene Krauthamer

How Can We Assess Computer-Assisted Reading and Writing Instruction?

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Introduction

Technology poses many challenges for reading and writing labs, not the least of which is selecting educational software to aid students in acquiring reading and writing skills. Packages come in a bewildering array of features, prices, hardware requirements, and training needs. Lab directors often do not have the resources available for adequately assessing the products that come to their attention nor is there a resource that provides evaluations of these products. The wide variety of computer software packages raises the question of how to assess computer-assisted reading and writing instruction (CARWI) and how to share these assessments with others. This paper will discuss the advantages and disadvantages of CARWI, describe some of the existing packages, and propose some guidelines about methods of evaluation, as well as present some online methods of dissemination.

Background

Currently, there are few, if any, resources available that evaluate CARWI, despite the great need for teachers and writing center staff to know what software to acquire and how to best direct students. There have been attempts

to assess computer-based instruction (CBI) in general. The Flashlight project has developed several evaluation instruments to help faculty and universities determine the effectiveness of technology in their classes and programs. Ehrman states that educational software should be "valuable" and "viable" where value is measured by "evaluation results, awards won, [and] testimonials from users," and viability is described as the software being "used by enough people for a long enough period of time that all its investors (original developers, funders, publishers, institutional support staff, faculty, and students) can justly feel that they each have received an adequate return on their own investments in developing, acquiring, and/or learning to use the software" (Ehrmann "On Value, Viability and Success"). There are few sources to consult, however, to determine the value and viability of specific software packages, other than by casual communication with their users.

Most agree that there are several advantages to CBI, regardless of the specific package. Student preference for technology is well documented, particularly for students with disabilities, (Fitzgerald), and merely using a computer allows students to learn "worldware" (Ehrmann "Asking") – the use of word processing, email, and the Internet, essential skills by most standards. Simply sitting at a terminal provides students with the opportunity to learn technological skills such as manipulating the mouse, keyboarding, and following directions from computer screens. Students who type learn to make distinctions they miss when they write by hand. Learning to use educational software makes students more aware of computer possibilities, and, of course, more comfortable

around computers, a necessity for those who have limited computer experience. Students with various learning styles may also respond more favorably to multimedia lessons that newer software provides with colors, motion, and even sounds.

Still, some question whether or not CBI is better than traditional instruction. Does CBI allow students to work longer, learn more independently, and perform better on tests? In 1995 Hobson characterized most programs as "nothing more than old workbooks and handbooks in electronic form" (215). Now, many still fit this description, but with the advent of CD-ROMs, more are beginning to include hypermedia and more interactivity. Responses, however, are still likely to be multiple choice or click and drag. When the response calls for actual writing, students need to compare their responses to model answers or ask for feedback from an instructor. The advantages are that feedback is usually immediate, the exercises are automatically scored, and, of course, responses are typed or clicked rather than handwritten. Essentially, computers have not revolutionized instruction, although students may be more motivated to receive instruction from a computer.

Furthermore, computer technology allows students to work independently, to take more responsibility for their own learning, possibly enhancing lifelong learning skills. These computer programs are almost all self-paced, occasionally pushing students into more advanced levels, but more often letting the student decide which topics to work on and how intensely. Research studies (Jonassen as cited by Reed) point out, however, that not all students do well with more

learner control, notably, that low ability students do more poorly with greater learner control, whereas high ability students do better. Reed applies this to interpret some of the contradictory findings of research on the benefits of computer-based writing instruction and in his own research finds that students of low ability require more assistance such as that found in composing process software, whereas students of high ability do best with less assistance, using only word processing programs. CBI, in any case, should not mean that the teacher is absent. Further research on this mode of instruction in general (Montague and Kirk) shows that students do best and prefer the lesson when a teacher is guiding the instruction. (See Kysela Consultants for a review of the research on computer assisted instruction since 1983.)

A pilot study (Krauthamer) did not show significant differences among the grades of students in an English composition class who consistently worked on computer writing software in the lab and those who did not. Kysela Consultants describe a research study at Alberta Vocational College evaluating the use of two reading packages, PLATO and Autoskills, on groups of adult learners. They report that although both instructors and students enjoyed using the software and benefited from the use of computers in the learning process, there were no significant differences between the groups using CAI and those following traditional instruction. They state, however, "No significant difference is significant. The literature indicates that for many teaching and learning situations, computer-assisted instruction is as effective as human instruction," and that

studies also show that computer use increases both teacher and student motivation.

Ehrman ("Asking") says that the question "Do computers do a better job of teaching English composition than traditional methods" is a "useless question," that computers are here to stay and our job now is to learn to use them more effectively to reach more students. It is important also to develop evaluation instruments of the programs themselves to help us make decisions regarding purchases and referrals of various software packages.

What types of CARWI are available?

Although several classification schemes are possible, CARWI may be roughly divided into the following categories: Writing process software, electronic handbooks, interactive exercises, comprehensive language programs, and online writing (and reading) labs (OWLs).

Some packages are devoted exclusively to the writing process, without reference to grammatical concerns. One example is *Expressways*, a package that takes the writer from the pre-writing stages through the various modes of rhetorical development, excluding mechanical matters. This allows students to start and complete their drafts directly on the program, following the cues. The lack of a proofreading component allows the writer to focus exclusively on the content and development of an assignment, permitting the writer to relax and write more freely. This replicates what human tutors are trained to do and may, in fact, do it better, insofar as human tutors often do get distracted by superficial details of mechanics and usage. Although we may tell students that content

counts most, too often in tutorials we are tempted to point out grammar errors that are best left for later discussions.

Some packages are electronic handbooks, such as *An Electronic Writer's Reference*. This package electronically replicates the contents of the grammar handbooks, also allowing students to do grammar and other writing activities on the computers, offering immediate feedback to their responses. An additional benefit is that this program can remain open while the student is working on a document, and the student can shift back and forth using the navigation bar at the bottom of the screen, keeping the electronic handbook readily available. This allows students to work directly on the topics that crop up as they are drafting their papers. Self-guided students can do quick grammar lessons in the context of their writing, thus making the instruction more meaningful than either traditional tutorials or isolated grammar drills.

For students who require more intensive instruction, interactive exercises drill students on particular topics in reading, mechanics, and/or grammar. These packages range from a simple interface such as that of *Writing Tutor IV*, where the student sees only text, to very elaborate screens, such as that of *Writer's Solution – Language Lab* and *Reading Road Trip* where the student is exposed to video displays and sound clips. *Writing Tutor IV* includes over 40 topics, with several types of exercises for each, ranging from multiple-choice to fill-in-the-blank. These programs can be more patient and thorough than a human tutor, allowing students to choose the amount of time they would like to spend on these lessons and providing a vast array of exercises. Also, these programs are

typically more interesting than the traditional workbooks and worksheets that used to compose most reading and writing labs.

Some packages are comprehensive language programs, such as *LearningPlus* from the Educational Testing Service. This package includes modules on reading, writing, and math, preparing students to take the Praxis exam, as well as providing students with basic literacy needs. It also has practice exams and is designed for long-term instruction, possibly replacing workshops and classes if done on a regular basis. The advantages are that students can select their own times for these lessons and may work at their own pace, receiving accurate and personalized instruction every time.

Finally, there are Online Writing Labs that are becoming quite prevalent and take many different forms, although all are available on the Internet. One of the most comprehensive is the Purdue OWL at http://owl.english.purdue.edu, one of the few with a search box. Some OWLs are interactive and provide feedback to students who take their online quizzes, such as the University of Connecticut Guide to Grammar (http://ccc.commnet.edu/grammar/), whereas some simply give information about various topics on writing. A comprehensive listing of OWLS is available on the National Writing Center Association website at http://nwca.syr.edu. There are not quite as many online reading labs, but some are being constructed, such as the University of the District of Columbia's Reading/ Writing Connection at http://hkrauthamer.tripod.com/main.htm. The advantages of these are, of course, the 24/7 accessibility, the great attraction of the Internet, and the appeal they have for all types of learners.

Factors of Assessment

When selecting CARWI, reading and writing labs may consider the following factors: Cost, convenience, attractiveness, and effectiveness.

Cost is, of course, of particular concern in most labs with limited budgets. Some CARWI packages are free from the publishers with the adoption of their textbooks. For example, *Expressways*, *Writing Tutor IV*, *Language Lab-Writer's Solution*, and *Reading Road Trip* were brought into our lab from publisher representatives. Some of these are packaged with textbooks so that students may have their own copies. Some are quite expensive, requiring a site license and user fees, such as *LearningPlus*. Typically, the more expensive packages allow better tracking and record keeping. OWLs are completely free, with Internet access.

Convenience is another factor, particularly in labs where there is limited technological support. Some programs are easy to install and require no registration or training such as *Writing Tutor IV*, but typically these do not have record keeping or multimedia. Others do require technical assistance. For example, *LearningPlus* required the phone assistance of the help desk at the Educational Testing Service and took several months before it was running properly in our lab, and several other labs were unable to install it. When fully functioning, however, it maintains records for individual students and provides very comprehensive learning modules. *Reading Road Trip* and *Writer's Solution-Language Lab* both require installation and CD-ROMs to run, but are installed easily. These programs both allow record keeping. Often, even when a program

is up and running, a newer version appears or sometimes a lab's computers may be updated, necessitating a renewed installation. OWLs, of course, are easy to access on the Internet, requiring no special assistance at all. Typically OWLs do not have record keeping, although some publishers are designing sites that require the use of passwords, and these may allow students to send reports to their instructors.

The attractiveness of the package to the users is also important to consider. Some have simple interfaces, using text only. For example, *Writing Tutor IV* has only words, no images, colors, or sounds. This is less appealing to some students who desire more exciting material but more appealing to advanced students who want to focus exclusively on skill building. Some packages use multimedia, with video and sound clips to accentuate the reading passages. *Writer's Solution-Language Lab* and *Reading Road Trip* both utilize very dynamic interfaces to appeal to visual and aural learners. OWLs range from very simple websites to elaborate, interactive sites, and most students appreciate the accessibility and convenience they offer.

Finally, labs need to consider the effectiveness of the programs they use. Measuring the effectiveness of any teaching method is difficult, requiring in the best circumstances, a carefully designed research study. Software publishers do not readily undertake this task (personal communication), and lab directors typically do not have the time to design such studies. What precisely would constitute an effective program? Some factors could be satisfaction levels, frequency of use, and increased levels of performance as measured by pre- and

post-test scores. Satisfaction levels are easily measured, and in most cases, programs receive relatively high ratings in general, particularly when compared to traditional lab resources such as handouts and workbooks (Krauthamer). Satisfaction levels for particular software packages, however, can vary according to level of user and also may change over time as the novelty of a particular package wears off. Frequency of use could be another measure, although this often reflects the availability of the program or the influence of teacher/staff referral. To adequately test levels of performance resulting from a particular software package, one would need to design a research study that includes a pre- and post-test with an experimental group and a control group, considering one package at a time. Kysela Consultants also describe some of the problems of doing controlled research studies with this population, such as difficulty in following up, selecting participants, and maintaining controlled settings. Ultimately they call for continued research, particularly as new products come out, to determine the best ways of integrating these programs into instruction.

How can we evaluate CARWI?

We still need to find ways of evaluating the software that enters the lab, to help lab directors decide on what they should acquire and recommend to their students, and also to disseminate these evaluations so that others can make educated decisions.

As a start to achieve these outcomes, I have begun two web sites to solicit and post descriptions of the software packages used in writing centers nationally and include the testimonials of the users. One site is currently housed at

http://www.geocities.com/hkrauthamer/maincawi.htm. Another is a Blackboard course site at http://www.blackboard.com/courses/CAWI. Both of these sites contain directions for submitting evaluations of software packages, posting a Standard Assessment Form that contains the following information:

Name of Package:
Publisher Information:
Cost:
Summary of Package: (Please describe what the package includes, providing a summary of its advantages and disadvantages.)
How easy is it to install and use?
How much do students use it?
How much do students like it?
How much do students learn?
Other comments:
Overall Rating:
Date of Submission:

Regarding grammar exercises specifically, Hacker has developed the following list of questions that might be asked of electronic programs:

General questions about the program

1. Can the student call up an answer following each response (instead of having to wait until the whole exercise has been completed)?
2. Does the program provide specific feedback explaining why an answer is correct or incorrect?
3. Can the student get help – by turning to an electronic handbook or by

calling up charts, lists, and the like?

Questions about an exercise set

4. Is the skill being tested important enough for students to spend time on?
5. Do the skills being tested match the content of the chapter or section?
6. Are all important skills tested? For example, does the student receive realistic practice in both identifying errors and choosing revision strategies?
7. Is on-screen reading kept to a minimum?
8. Is the level of difficulty appropriate? Not frustratingly difficulty? Not insultingly simple?
9. Is the content interesting?

Questions about an exercise sentence

10. Is the incorrect choice a realistic error?
11. If an explanation of the answer is given, is it clear?
12. Is the answer correct?

This basic set of questions may serve as a checklist for reviewers of programs, possibly even transforming into a scale whereby each affirmative answer yields a point; thus, on the "Hacker Scale" a program could rate a maximum score of 12. Ideally, a program could have a panel of scorers, consisting of representative teachers and students who would provide feedback after an agreed upon amount of time using the particular program. Their scores could then be averaged to yield a rating that could be used to evaluate the nature of the grammatical exercises of one package with another.

Conclusion

Most agree that computer assisted learning should not replace teachers but should supplement instruction. In the reading and writing lab setting, CARWI can provide instruction where none exists, allowing students to access tutorials when tutors are unavailable. Perhaps the biggest advantage of CARWI is its potential to provide individual attention to more individuals; twenty computer terminals can tutor twenty students when there is only one (or no) human tutor available. Also, as Reed points out, with the use of multimedia and other innovating forms of instruction, there is finally the possibility of addressing individual learning styles, something not easily done in the traditional classroom. Of course, computers and learning software are costly, prone to failure, and, if not entertaining enough, run the risk of boring students as well. Computers cannot form meaningful relationships with students, as a tutor supposedly could. On the other hand, students are often enthusiastic about using computers, and some may even prefer working in an environment where there is no risk of personal embarrassment. Also, some students may trust the accuracy of computer tutorials over human tutorials. Frequently, the computer labs are high priority in schools, more so than faculty. The equipment is already available in many places, so the issue is mostly about selecting the most suitable software. If lab personnel and other software users could reflect on their use of educational software and pool their collective experiences, our use of technology in teaching would be far more effective.

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