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The Effect of Computers on Student Writing: What the Research Tells Us

The Effect of Computers on Student Writing: What the Research Tells Us

The Question

What effect do word processors have on student writing—specifically as related to writing quantity and quality, as well as the revision process?

The Context

Educators have long been interested in the utility of computers in the classroom. While computers present a range of classroom applications, one of their most frequent uses has been for word processing. Much of the research related to computers focuses on the effect of their use on academic achievement in general. This study, however, looks at the body of literature related to the effect of computers used specifically for word processing on student writing. Previous studies have found positive correlations between computer use and the length and quality of writing, but mixed results when looking at the effect of computer use on revision within the writing process (prewrite-draft-revise-edit-publish).

The Study

This study reviewed 99 recent studies related to the effect of word processing on student writing. From this initial body of studies, researchers selected 26 for meta-analysis.¹ To be included in this group, the studies had to:

- be conducted between 1992 and 2002;
- use a quantitative methodology (with results reported so as to allow for an effect size calculation);
- measure a word processor's effect over time (or directly compare word processing and pencil-and-paper writing);
- evaluate "quantity," "quality," or "revision" of student writing;
- focus on more than the effect of grammar and spelling checkers or multimedia aspects of word processing;
- not focus on test administration; and
- focus on students in grades K–12.

In addition to the 26 studies selected for meta-analysis, a separate analysis was conducted on 35 other articles that did not fully meet the requirements above (the studies may have insufficiently reported their data, used a qualitative methodology, or focused on concept or commentary).

The data analysis focused on three areas: quantity of writing, quality of writing, and the number of revisions. The researchers found the following:

- The use of a word processor had a positive effect on the quantity of student writing (the effect size² was moderate, at .5 standard deviation units). This effect was stronger for middle and high school students than for elementary age students.
- Word processor use also positively affected the quality of writing, however, the effect was small (an effect size of .41). As with the analysis on quantity of writing, the quality of writing was more strongly affected by

word processor use as students reached higher grades.

- The number of studies examining the relationship between word processor use and revision was too small to analyze statistically. Even so, all of the relevant studies looking at revision (six) found that students using computers did make more changes to their writing than did students using pencil or pen and paper.

Thirty-five of the 99 initially identified studies could not be included in the meta-analysis. Because they did focus on the effect of word processors on student writing, however, they were analyzed qualitatively. These studies generally suggest that when students used word processors, the writing process became more collaborative and involved increased peer editing; revision began earlier in the writing process, with students actively revising as they drafted; student motivation to write improved; and students with greater access to word processors performed better over time than students with less access. Despite these generally positive findings, at least one study found a negative effect on writing quantity and quality (a 1994 study focusing on 3rd grade students).

Who's affected?

Affected students include, generally, K–12 students developing their writing skills and, specifically, students in middle and high schools.

Caveats

Although word processors were found to have a small to moderate positive effect on student writing when compared to students using pencil or pen and paper, the study did not attempt to analyze the relationship from a cost-benefit perspective. There may be other, less costly interventions available to improve student writing. Additionally, although some of the studies that were analyzed qualitatively found that students using word processors were more willing to make changes in their writing, those changes did not necessarily rise to the level of “revision”—entailing, instead, altering word choice or making other simple edits, for example.

The Bottom Line

Students using word processors for writing generally produce longer, higher-quality writing than students using pencil or pen and paper.

The Study

Cook, A., Goldberg, A., & Russell, M. (2003, February). The effect of computers on student writing: A meta-analysis of studies from 1992 to 2002. *Journal of Technology, Learning, and Assessment*, 2(1). Available: <http://www.bc.edu/research/intasc/jtla/journal/v2n1.shtml>

Other Resources

Readings

Bangert-Drowns, R. L., & Rudner, L. M. (1991). Meta-analysis in educational research. ERIC Clearinghouse on Assessment and Evaluation, ED339748. Retrieved February 28, 2003, from <http://ericae.net/edo/ED339748.htm>

Eisenberg, M. B., & Johnson, D. (2002). Learning and teaching information technology: Computer skills in context. ERIC Clearinghouse on Information and Technology, ED465377. Retrieved February 28, 2003, from <http://searcher.eric.org/digests/ed465377.html>

Glass, G. V. (2000). Meta-analysis at 25. College of Education, Arizona State University. Retrieved February 28, 2003, from <http://glass.ed.asu.edu/gene/papers/meta25.html>.

Simic, M. (1994). Computer assisted writing instruction. ERIC Clearinghouse on Reading, English, and Communication, Digest #97. Retrieved February 28, 2003, from http://www.indiana.edu/~eric_rec/ieo/digests/d97.html

Lehr, F. (1995). Revision in the writing process. ERIC Clearinghouse on Reading, English, and Communication, ED379664. Retrieved February 28, 2003, from http://www.indiana.edu/~eric_rec/ieo/digests/d100.html

Endnotes

¹ Meta-analysis is a collection of systematic techniques for resolving apparent contradictions in research findings. Meta-analysts translate results from different studies to a common metric and statistically explore relations between study characteristics and findings (from *Meta-Analysis in Educational Research*, ERIC Digest (<http://ericae.net/edo/ED339748.htm>)).

² Effect size is a measure designed to quantify the effectiveness of a specific intervention as compared to another intervention. In this case, the intervention is use of a word processor, while the comparison intervention is writing by hand. As noted by the authors, effect sizes between .2 and .5 are generally considered small, between .5 and .8 are considered medium, and .8 or greater are considered large.

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