Wireless Web Browsing and Academic Performance

Evaluation of Web browsing data showed mixed effects of browsing behavior on student performance

By **Geri Gay** and **Michael Grace-Martin**

Astudy we conducted at Cornell University found that wireless-computing programs have mixed effects on students' grades. We meant our study to test assertions that ubiquitous access to computers enhances student performance and that laptops "extend" the school day because students continue working on assignments after class ends. Our results showed that while unfettered access to the Internet can enhance a learning environment, it can also harm students' grades in some cases.

The Study

Students in two different courses (one in communications, the other in computer science) were given laptop computers with wireless network access during the course of a semester. Students' Web browsing on these laptops (including URLs, dates, and times) was recorded 24 hours a day, 7 days a week in a log file by a proxy server during most of a semester (about 15 weeks). We divided this Web browsing into three contexts: wireless laptop browsing in class, wireless laptop browsing between classes, hard-wired laptop browsing at home.

We recorded the amount of time that each student spent surfing the Web and the number of Web pages visited, noting the content (entertainment-related content versus the class Web site). We then compared that to the student's grade at the end of the semester.

The formats of the two test courses differed substantially. The computer science course used a traditional lecture and note-taking format that made little use of laptops during the class period. The communications course used a more participatory, discussion format that incorporated a variety of in-class activities requiring students to use their computers to find information and participate in collaborative activities using the Internet.

The emergence of statistically significant results suggests that quantitative characteristics of browsing behavior can be useful predictors of meaningful behavioral outcomes. Variables such as number of browsing sessions and length of browsing sessions correlated with students' final grades. The valence and magnitude of these correlations were found to interact with the course (whether a student was enrolled in the communications or computer science course), browsing context, and gender. The study discussed implications of these findings in relation to previous studies of laptop use in educational settings.

Observations

Communications students who visited more Web sites during class than their classmates scored higher than other students in the course. As the report pointed out, Web browsing was an integral part of the course, which studied how the Internet aids communication.

However, those communications students who spent relatively more time online at home performed less well than those who spent little time online at home. In general, communications students spent 40 percent of their time online at home, compared with 15 percent of their time online in class. The differences in Web browsing accounted for only 24 percent of the difference in grades.

Contrasts appeared in the computer science course as well. The more time that computer science students spent browsing during class, the worse they performed, according to the report, although the differences in browsing time accounted for only 13 percent of the difference in grades. Browsing times outside of class seemed to have little effect on the students' grades.

The full study is available online at <http://www.hci.cornell.edu/nomad/research/>. In addition, an article about the study appeared in a special issue of *Educational Technology and Society* (July 2001). *e*

Geri Gay (gkg1@cornell.edu) is a professor of communications and director of Cornell University's Human-Computer Interaction Group. Michael Grace-Martin (mgm@mindtree.org) is an independent Web developer and consultant specializing in educational applications and multimedia.