

One-to-One E-learning Research

Several researchers conducted a variety of studies to examine the effects of one-to-one e-learning on students and teachers. The following summaries describe some of the findings and provide links to sources and additional information.

Literacy Skills

One study looked at the differences in achievement between students who took part in a one-to-one laptop program and those who did not as related to the phenomenon known as the *fourth-grade slump*. This is the term used to describe the time when school literacy practice transitions from “learning to read” to “reading to learn.” Many students, especially those from low socio-economic environments, struggle at this period of their schooling.

Students in the laptop immersion program used their laptops to (in order from most to least use):

- Write papers
- Browse the Internet
- Create presentations
- Use calendars
- Work with photos
- Work with movies
- Take quizzes

A statistical analysis of students’ scores on standardized tests found that:

- Students with laptops showed significantly greater achievement in literary response and analysis, and writing strategies.
- Neither the laptop group nor the control group demonstrated a fourth-grade slump, but the non-laptop group did experience a fifth-grade slump.

Suhr, K. A., Hernandez, D. A., Grimes, D., & Warschauer, M. (2010). Laptops and fourth-grade literacy: Assisting the jump over the fourth-grade slump. *Journal of Technology, Learning, and Assessment*, 9(5). Retrieved from <http://escholarship.bc.edu/cgi/viewcontent.cgi?article=1207&context=jtla>

Teacher and Student Impact

The Berkshire Wireless Learning Initiative provided laptops to all students in five middle schools. Researchers used a combination of quantitative and qualitative methods to study the effects of the program on teaching and learning.

Within three years of the beginning of the program, teachers greatly increased their

use of technology (ordered from most to least use):

- Delivering instruction
- Preparing and maintaining student Individual Education Plans (IEPs)
- Adapting activities to students' individual needs
- Creating student handouts
- Creating student activities
- Researching and planning lessons with the Internet
- Creating lessons that incorporate Internet activities

Laptops for all students had a significant impact on student behaviors:

- The majority of students were more on-task and engaged in learning activities.
- Students worked more collaboratively with peers.
- Students improved their research skills by using the Internet.
- Teachers reported that students were more able to work independently.

An examination of test scores of students with laptops compared to students with normal computer use showed mixed results:

- Overall, students in one-to-one e-learning programs scored higher in English language arts but not in math.
- Sixth and seventh grade students in the laptop program wrote more words and scored better on Topic Development and Standard English Conventions in their writing.

Bebell, D., & Kay, R. (2010). One-to-one computing: A summary of the quantitative results from the Berkshire Wireless Learning Initiative. *Journal of Technology, Learning, and Assessment*, 9(2). Retrieved from <http://escholarship.bc.edu/jtla/vol9/2>

Improved Academic Achievement

The Laptop Immersion Program was started in 2001 in Harvest Valley Middle School and has since been incorporated into all middle and high schools in California's Pleasanton School District. Researchers compared the achievement of participants in the program with the achievement of students not enrolled in the laptop program. Both groups of students had similar demographics and received the same curriculum. The research found that participation in the laptop program was related to higher student achievement.

- **Grade Point Averages:** Students in the Laptop Immersion Program received more As and fewer Fs than their counterparts.
- **Writing Assessment:** Overall, more students in the laptop program passed a writing test, although no difference occurred between the two groups at the highest (4) and the lowest (1) scores.

- **Norm-referenced Test:** In language and mathematics, a greater proportion of students with laptops scored at or above the national average.
- **Standards-based Assessment:** Across all grade levels, more students in the Laptop Immersion Program met or exceeded English language arts and mathematics standards than did students not in the program.

Gulek, J. C., & Demirtas, H. (2005). Learning with technology: The impact of laptop use on student achievement. *Journal of Technology, Learning, and Assessment*, 3(2). Retrieved from <http://escholarship.bc.edu/cgi/viewcontent.cgi?article=1052&context=jtla>

Changes in Teaching

ROCKMAN ET AL, a research company, conducted three studies of the Microsoft Anytime Anywhere Learning Program* in 1998, 1999, and 2000. The final report found one-to-one e-learning offered several benefits for teachers and students:

- Teachers in the laptop program reported moving toward a more student-centered instructional practice.
- Teachers reported asking students more often to conduct data analysis and research, collaborate on projects, and create electronic products.
- Students with laptops improved in writing performance in all areas that were measured: content, organization, language/voice/style, and mechanics.
- Comparisons of the test scores of students in the laptop program and those not in the program were inconclusive.

ROCKMAN ET AL. (2000). *A more complex picture: Laptop use and impact in the context of changing home and school access—the third in a series of research studies on Microsoft's Anytime Anywhere Learning program*. Retrieved from http://sharepoint.niles-hs.k12.il.us/technology/tcsi/Technology%20Plan/Appendix/Laptop_Use_and_Impact.pdf