



Research

Meta-Analysis: Is Blended Learning Most Effective?

- By [David Nagel](#)
- 07/01/09

The [United States Department of Education](#) reported recently that it's found some evidence to support the notion that blended learning is more effective than either face to face or online learning by themselves. Further, between online and face to face instruction, online is at least as good and may even have the advantage in terms of improving student achievement and potentially expanding the amount of time (and quality time) students spend learning.

The report, "[Evaluation of Evidence-Based Practices in Online Learning](#)," is the result of a meta-analysis involving research published from 1996 to July 2008, in which ED sifted through more than 1,100 empirical studies of online learning, 46 of which "provided sufficient data to compute or estimate 51 independent effect sizes," according to the report. The study included only objective measures of learning (rather than opinions of the effectiveness of learning) from studies with controlled designs that met the researchers' minimum quality standards. It included research on both K-12 and post-secondary education.

The results it found were mixed, but they leaned in favor of blended and online learning. "Among the 51 individual study effects," the report stated, "11 were significantly positive, favoring the online or blended learning condition. Two contrasts found a statistically significant effect favoring the traditional face-to-face condition."

"This new report reinforces that effective teachers need to incorporate digital content into everyday classes and consider open-source learning management systems, which have proven cost effective in school districts and colleges nationwide," said U.S. Secretary of Education Arne Duncan, in a statement released to coincide with the publication of the report. "We must take advantage of this historic opportunity to use American Recovery and Reinvestment Act funds to bring broadband access and online learning to more communities."

ARRA funds, combined with the 2009 operating budget, brought K-12 education technology spending (via EETT, or "Enhancing Education Through Technology," part of Title II D of the No Child Left Behind Act) to historic highs--\$650 million on top of the FY 2009 budget of \$269.9 million. But this figure may drop off drastically in 2010, down to the historic low of \$100 million, barring any changes to the [budget proposed by the Obama administration](#).

"To avoid being caught short when stimulus money runs out, school [administrators] should use the

short-term federal funding to make immediate upgrades to technology to enhance classroom instruction and to improve the tracking of student data. Technology presents a huge opportunity that can be leveraged in rural communities and inner-city urban settings, particularly in subjects where there is a shortage of highly qualified teachers. At the same time, good teachers can utilize new technology to accelerate learning and provide extended learning opportunities for students."

The vast majority of the research used in the meta-analysis took place among older learners; only five controlled studies (with seven contrasts between online and face to face environments) involved K-12 students. For this reason, ED advised, "caution is required in generalizing the study's findings to the K-12 population because the results are for the most part based on studies in other settings, such as in medical, career, military training, and higher education."

Marshall Smith, senior counselor to the secretary of education, said, "Studies of earlier generations of distance and online learning courses have concluded that they are usually as effective as classroom-based instruction." Further, he said, "The studies of more recent online instruction included in this meta-analysis found that, on average, online learning, at the post-secondary level, is not just as good as but more effective than conventional face-to-face instruction."

But Web-based instruction may not be in and of itself superior to in person instruction. Rather, according to the study, it's likely a matter of other factors: "Despite what appears to be strong support for online learning applications, the studies in this meta-analysis do not demonstrate that online learning is superior as a *medium*. In many of the studies showing an advantage for online learning, *the online and classroom conditions differed in terms of time spent, curriculum and pedagogy*. It was the *combination* of elements in the treatment conditions (which was likely to have included additional learning time and materials as well as additional opportunities for collaboration) that produced the observed learning advantages. At the same time, one should note that online learning is much more conducive to the expansion of learning time than is face-to-face instruction." (Emphasis was not added.)

The report also noted that many of the studies involved in the meta-analysis suffered from a variety of weaknesses, including small sample sizes and potential biases. And, since the majority of studies involved focused on post-secondary students, the mean effect size for K-12 students is not significantly positive, though it is for post-secondary students.

"Another consideration is that various online learning implementation practices may have differing effectiveness for K-12 learners than they do for older students," the report added. "It is certainly possible that younger students could benefit more from a different degree of teacher or computer-based guidance than would college students and older learners. Without new random assignment or controlled quasi-experimental studies of the effects of online learning options for K-12 students, policy-makers will lack scientific evidence of the effectiveness of these emerging alternatives to face-to-face instruction.

The analysis was conducted by the [Center for Technology in Learning](#). It was commissioned by the Office of Policy and Program Studies Service, a unit of the Department of Education. A complete copy of the report can be found [here](#).

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