

# Strategies for E-Learning

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How do learners benefit from technology? Do traditional training methods work as well? Which types of e-learning are effective? What kind of online tutorial or course should an employer consider for its employees? Will a simple PowerPoint presentation do the job? During the past 30 years or so, several different strategies for learning with technology have evolved that can help learners meet different goals. This document examines a few of these ways to learn and touches on some of the research and controversies that employers might want to consider in making decisions.

According to Reeves (1998), as cited in Ringstaff and Kelley (2002), learners use technology in one of two ways: either they learn “from” computers or “with” them using the computers as “tools.” The various strategies for computer instruction can be placed into one or the other of these two groups (Table 1). For example, computer-assisted instruction (CAI) might consist of self-paced modules for learning, but computer-managed instruction programs (CMI) could assess the students’ abilities and base instruction on those assessments (The Pros and Cons of Technology in the Classroom, 1998). Learning with these two strategies is

learning “from” the computer. On the other hand, computer-enhanced (CEI) instruction might consist of completing an innovative project. CAI and CMI have documented effectiveness, especially for learning such skills as mathematics and boosting scores on high-stakes tests (The Pros and Cons of Technology in the Classroom, 1998; Ringstaff and Kelley, 2002). CEI can offer advantages for learners needing to develop project, collaborative, or higher-order thinking skills.

During the 1998 debate on the Pros and Cons of Technology in the Classroom at the Bay Area School Reform Collaborative Funders' Learning Community Meeting in Palo Alto between Roy Pea (Director, Center for Technology in Learning, SRI International) and Larry Cuban (Professor of Education, Stanford University), Pea describes how technology can impact learning and teaching in innovative ways, while Cuban challenges the seekers of technology to answer “concrete” questions related to cost versus benefit. Although Cuban discusses several strategies incorporating the use of technology, he tends to exclude many of the newer strategies, which may have not yet have been as thoroughly researched as older ones. A focus on some of the more innovative methods in online

**Table I. Learning “From” and “With” the Computer**

<b>Strategies</b>	<b>Examples</b>	<b>Advantages</b>
<p>“From”</p> <ul style="list-style-type: none"> <li>▪ Computer-assisted instruction (CAI)</li> <li>▪ Computer-based instruction (CBI)</li> </ul>	<p>Programmed instruction, computer-guided instruction</p>	<p>Learn basic skills and knowledge; prepare for standardized examinations.</p>
<p>“With”</p> <ul style="list-style-type: none"> <li>▪ Computer-enhanced instruction (CEI)</li> </ul>	<p>Projects, publishing, Internet communications.</p>	<p>Perform higher-order thinking; learn from up-to-date sources; learn online collaboration; produce “new” knowledge.</p>

*Sources:* Based on discussions in The Pros and Cons of Technology in the Classroom (1998) and Ringstaff and Kelley (2001).

instruction may have given Pea an advantage in advocating for CEI.

Commenting on how broad a term *technology* is, Pea begins by citing examples of what previous generations might have considered “technology” such as radios and visual slides. Currently, we consider “technology” to be computers. In fact, according to Pea, without human intervention, all these tools are neutral in terms of benefits. Ironically, Pea notes “technologies can carry or promote virtually any value system into the classroom, including outmoded methods of instruction.”

Pea admits to challenges in implementing technology, but he asserts that we can use these new tools in “radical” ways that will transform how we learn, collaborate, and think (e.g., meeting in multi-user environments where many different communication tools are available), allowing learners even to produce new knowledge and publish that knowledge. Learners can form new communities on the Internet, and professionals can access continuing professional development. Pea believes that technology can lead us not just to do things better but to do “better things.” He recognizes that using similar methods in new environments will not bring different results.

On the other hand, Cuban describes the three strategies of instruction mentioned: CAI, CMI, and CEI. Cuban and Pea agree that Pea’s focus is on CEI. Cuban stipulates that those seeking funds for technology should answer three questions involving (1) their goals, (2) whether the goals can be reached at less expense using a different method, and (3) which “configuration” of technology would work best to meet the goals.

At first glance, these questions seem completely reasonable. However, by insisting on a specific configuration designed for a specific method, Cuban potentially limits the learner from exploring new frontiers as they

emerge, possibly even promoting an earlier obsolescence for technologies that could have served for a range of forthcoming uses. In addition, the one example of a low-tech method that Cuban cites as more cost effective than a high-tech strategy refers to a colleague’s study of CAI versus peer tutoring. Not only does the CAI example appear tepid compared with the “radical” methods cited by Pea, but comparing CAI with peer tutoring is putting “apples with oranges.” A study comparing online peer group work with offline peer group work might illuminate the added value of the technology, but evaluating peer tutoring against CAI will not tell us much about what technology might add. In fact, it may be impossible altogether to compare strategy with strategy where no comparable strategies exist, but if it is absolutely necessary to make comparisons, high-stakes standardized tests may reveal more about how learners are performing in new learning environments (Downs, 2007).

In an arena where traditional learning will be competing with virtual learning for funds, we should look beyond comparisons between specific methods to see how traditional training compares with virtual training. Downs (2007) argues in favor of funds for charter schools by citing how the Florida Virtual Academy, based in Jacksonville, has surpassed Florida school averages in all subjects and at all grade levels. At the same time, parents and students at the Florida Virtual School (Orlando) overwhelmingly rate the quality of the virtual courses the same as or better than traditional (Annual External Evaluations of FLVS. Executive Summary, 2005-2006), and the scores on advanced placement tests at the same school have received media coverage for exceeding state and national averages (Sturgeon, 2007). Such figures may begin to generate more interest in trainers trying out newer methods.

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