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REVIEW OF
OVERSOLD AND UNDERUSED: COMPUTERS IN THE CLASSROOM

Oversold and Underused: Computers in the Classroom

Larry Cuban

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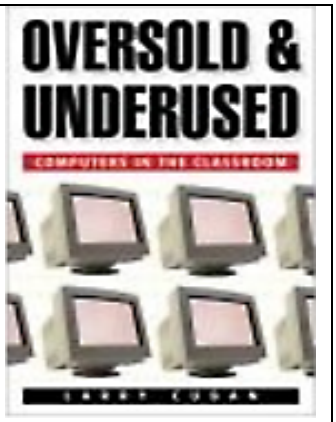

Review by Lara Lomicka, The University of South Carolina

"Computers have been oversold and underused, at least for now," claims Larry Cuban (2001, p. 179) in his most recent study on computers in classrooms. This book offers a compelling look at how computers are being utilized in the educational environment and engages readers to ponder how teaching and learning have changed since many institutions have jumped on the technological bandwagon. Cuban's work, which is essentially free of technical jargon and presented in the form of case studies, takes readers on a journey into several classrooms and enables them to become acquainted with the teachers. Three questions drive Cuban's work:

1) In schools where computers are available, how are they being used for instruction?
2) How have teaching and learning changed as a result of steady increases in hardware and software in schools in the last two decades?
3) Has the investment in new technologies been worth the cost? (p. 19)

In pointing out that many Americans believe education can change the way we live, Cuban begins his book with a discussion on educational reform. A more recent area of reform in schools is what Cuban terms the push toward "new technologies." Many believe that this type of reform may be a way to revolutionalize teaching and learning in that it would move away from teacher-centered instruction and encourage collaboration and discussion, student-led projects, and student-centered environments. "New technologies," according to Cuban, include both hard and soft infrastructure such as wiring, laserdiscs, computers, digital cameras, technical support, and professional development. Many proponents of school reform through new technologies share the belief that once these technologies are present in the classroom, they will be instrumental in transforming educational practices. Cuban sets out to investigate this idea.

In chapter 1, Cuban provides details about the site chosen for the investigation: California's Silicon Valley. Over the past two decades, the Silicon Valley has become associated with wealth, change, and transformation, from dot.com millionaires to computer and Internet companies. As a result of rising favorable economic conditions in the 90s, Silicon schools were supplied with computers, quickly wired, and teachers were provided with training. The technological wealth in this area of the country allowed Cuban to examine reformers' assumptions about computers, teaching, and learning.

In chapter 2, we travel into two schools, Benjamin co-op preschool and George Elementary School where we meet preschool and kindergarten teachers Ms. Rodrigues and Mr. Hunter. Their classrooms as well as classroom practices are described in detail. Both of these teachers are frequent users of computers and integrate technology regularly into instructional practices. Also in this chapter, Cuban outlines levels of technology integration (pp. 53-54) based on work done by Sandholtz, Ringstaff, & Dwyer (1997).

Levels of Technology Integration	
Entry	Teachers are beginner users of computers.
Adoption	Teachers tend to take more traditional approaches to instruction but do provide some explanation on how to use computers.
Adaptation	Traditional approaches to instruction prevail but some class time is allowed for students to use computers for homework and daily class work.
Appropriation	Teachers integrate technology regularly into the curriculum.
Invention	Teachers find new ways to connect students and use project-based and interdisciplinary approaches to instruction.

During his research, Cuban found few teachers who reached the "invention" level of technology integration. In the elementary setting, most schools remained at the adoption level. From Cuban's observations, he concludes that computers in preschools and elementary levels are used most often during "choice time" (p. 50) when students can choose from various activities offered by different learning centers. He found that computers were used to maintain current instructional practices and thus they added another option to the existing learning centers. Cuban also found that use of computers was less important than cultivating social, civic, and academic values in children and that traditional models of instruction (learning centers) were sustained rather than transformed.

In chapter 3, we visit two of the Silicon Valley's technology rich high schools: Flatland and Las Montañas. Two classrooms were studied in depth (data were triangulated through student and teacher interviews, questionnaires, student shadowing, and classroom observations); in both classrooms one computer was available to teachers, who used it primarily to prepare for class rather than during instruction. It may not be surprising then that nationwide, reports show that word processing is the most common reason for computer use by high school students and teachers. What Cuban found after examining the data follows a national trend: After steady and perhaps excessive promotion of technology, computer use in the classroom was uneven and intermittent. Cuban points out that even though access to machines was maximal, change was minimal (p. 93). When new technologies were adapted, old practices were sustained. The final "case" (chapter 4) takes readers to Stanford, an "old" university using new technologies. As access to computers increased, student and professor use of computers changed drastically: Students generally use computers for word processing, to search the Internet, and for e-mail; professors use computers for their research rather than in the classroom. Cuban is quick to point out that lectures, as a means of instructional delivery, remain dominant in undergraduate classes. Traditional methods of instruction have changed very little in the past few decades (for more information, see, for example, Cuban, 1993; Goodlad, 1984). Although computers are extremely visible at Stanford, Cuban questions how and if faculty are actually using the machines. Surveys conducted in 1989 and 1997 indicated that the overhead and VCR were the two most frequently used machines in the classroom. Findings revealed that computers, while used in the preparation for instruction, are very rarely utilized during the instructional process. In fact, Cuban estimates that only a few teachers (1 or 2 % of Stanford faculty) have reached levels of appropriation and invention of technology integration.

Finally, Cuban offers several theories that explore whether computers are worth the investment. In addition to a few expected findings (increases in access and in at home use of computers), Cuban found many unexpected outcomes or "revenge effects." The last two chapters attempt to make sense of these outcomes and answer why with increased availability and access, computer use in the classroom has been

so infrequent. Some of Cuban's unexpected findings about computer access include the following: Teachers are not technophobes; most teachers do not use computers during class time; most high school students do not have a "tech-heavy" experience; most teachers and even occasional computer users are not serious users of technology; and when computer use occurred it was most often peripheral to instructional tasks (pp. 132-133). Outcomes about teaching and learning were also unexpected: There was no concrete evidence that revealed gains in academic achievement as the result of using computers; the majority of teachers using computers maintain existing practices of teaching; and few students used technologies at the invention level. Cuban offers three explanations to the unexpected findings and outcomes of his work: (a) the slow revolution -- slow-motion change will eventually transform teaching and learning; (b) history and context of teaching -- gaps between different sectors of society and the beliefs that these people hold influence what happens in the classroom; and (c) culturally constrained choice -- while teachers beliefs and values reflect what they do in the classroom and while they choose what to endorse, reject, and modify, they are still influenced by the structure of American institutions (p. 170). Cuban does not fully endorse any of these three explanations; rather he concludes that computers have been oversold by policy makers and promoters, and underused by those in education. His vision for making the most of the new technologies reform is in bringing together teachers with parents, policy makers, corporate officials, and public officers to work on questions such as: how technology can build stronger communities and citizens and how monies can achieve larger social and civic goals?

Although Cuban's book addresses education in a general sense, visits were made to foreign language classrooms. In a high school French class in the Silicon Valley, one computer was available in the classroom, and the teacher used it for the purpose of recording grades. However, a student explained that computers had been used for a French project in the media center. A professor of Spanish at Stanford worked with a faculty development group to create a multimedia database for Mexican-American artists but details were not provided as to how or if this professor actually used computers in the classroom. Generally speaking, students surveyed in the schools reported little to no use of computers in foreign language classes. Since the focus of Cuban's research was not second language classes, it may be interesting to conduct a longitudinal study documenting the use of computers in second language classrooms. How exactly are language teachers using computers? How have teaching and learning changed in the language classroom? Much literature has been published in the last decade that points to an increase in computer use in language learning (for other reviews of previous literatures, see, e.g., Cubillos, 1998; Liu, Moore, Graham, & Lee, 2002; or Salaberry, 2001). That said, we might ask if computers have been worth the investment in language learning. A more recent development in language learning and technology research involves using computers as a tool for communication, particularly in telecollaborative and intercultural learning communities (see, e.g., LLT volume 7, number 2). Projects such as CULTURA at MIT, Penn State Telecollaboration Project at University Park, and the Raison d'Etre Project at Dickinson and the University of South Carolina all link technology with theory and pedagogy, as they work toward fostering intercultural communication and international communities between classes in the United States and in other countries. Had Cuban included observations that document the recent growth and development of telecollaborative work, perhaps findings in the area of language learning may have yielded somewhat different results in his research.

In sum, *Oversold & Underused* is well worth the read: it is both compelling and thought provoking. Cuban sounds a clarion call to critically examine how computers are currently used in instruction. As we continue to speed ahead and attempt to keep with the technological revolution, Cuban takes time to explore and respond to challenging questions that those in education should consider carefully. Are computers worth the investment? According to Cuban, investment "has yet to produce worthy outcomes" (p. 197).

ABOUT THE REVIEWER

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