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Technology makes possible the democratic education envisioned by Jefferson as necessary for responsible, effective citizens of a healthy democracy

By **Daniel Menchik**

It cannot be doubted that in the United States the instruction of the people powerfully contributes to the support of the democratic republic; and such must always be the case.¹

Alexis de Tocqueville

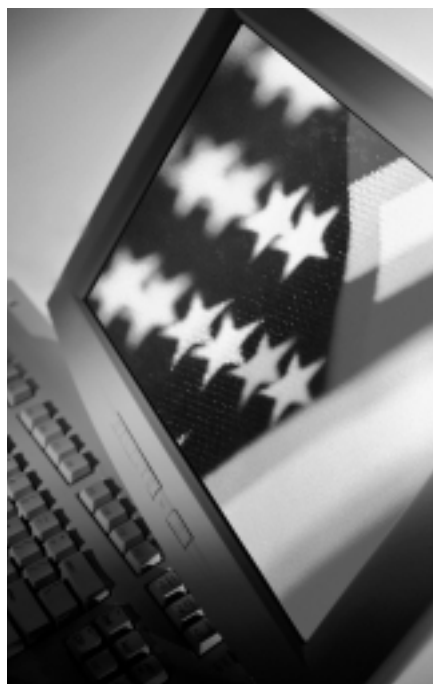
Now is an exciting time to be in school. As a result of advancements in computer technology, more people have the ability to access high-quality information than ever before. Computers enable democratic education with their capacity to create an effective learning environment, educate students with special needs, and extend resources beyond classroom walls.

After defining what I mean by democratic education, I will outline computer-mediated education's uniquely democratic characteristics and provide examples of programs and uses that capitalize on these characteristics.

A Tool for Transforming Democratic Education

I see democratic education as the diffusion of subject matter in a way that allows customization for personal learning needs, creates widespread access to quality resources, and removes institutional barriers to quality learning environments. Through this process, computer-mediated education becomes a potent tool for actualizing a more democratic republic.

Communications scholar Marshall McLuhan would appreciate this message in reference to the computer. When evaluating methods of commu-



nication, he wrote, "the medium is the message."² In other words, based on the means of communication, the message content will carry different connotations. The computer eliminates access restrictions to educational resources by providing a medium that can be modified to create an inexhaustible potential for learning, both on individual and pluralistic levels.

The first computer — the Altair 8800 — was invented 25 years after the death of philosopher John Dewey in 1952. I believe he would have valued its use, and especially the use of its successors, in supporting his educational ideals. Dewey recognized technology as a powerful force in modern society:

The significant outward forms of

the civilization of the western world are the production of the machine and its technology. ... In its effect upon men's external habits, dominant interests, the conditions under which they work and associate, whether in the family, the factory, the state, or internationally, science is by far the most potent social factor in the modern world. It operates, however, through its undesigned effects rather than as a transforming influence on men's thoughts and purposes. Habits of thought and desire remain in substance what they were before the rise of science, while the conditions under which they take effect have been radically altered by science.³

Today, computer technology is designed to shape our "habits of thought and desire." Computers have become ubiquitous within offices and schools, and computer literacy is probably now as much a prerequisite for jobs as communication skills. When an increasing amount of work demands computer literacy, learning methods that incorporate parallel technology could prove far more effective than those that do not.

Students completely engaged in computer use occupy an environment wholly separate from their physical surroundings. An advantage of online instruction lies in the ability to craft an environment that idealizes learning of a particular subject matter. As Dewey said, "We never educate directly, but indirectly by means of the environment.

It is the situation, not the teacher, school, or recitation that makes the subject of vital interest to the learner.”⁴ He explained that all environments are chance environments, in so far as their educative influence is concerned, unless they have been deliberately regulated with reference to educative effects.

With the help of the Internet, students can associate with those studying the same sonnet or mathematical problem thousands of miles away. The impact of this scholarship can be as, or more, effective than education in the physical classroom. According to Dewey,

Persons do not become a society by living in physical proximity, any more than a man ceases to be socially influenced by being so many feet or miles removed from others. A book or a letter may institute a more intimate association between human beings separated thousands of miles from each other than exists between dwellers under the same roof.⁵

Although some have interpreted the online educational experience as isolating, Sherry Turkle found otherwise. In researching the experiences of students working with computers in schools, she discovered a deep emotional and intellectual engagement that catalyzed psychological development and learning. She found that the engagement fostered a focused concentration marked by a loss of a sense of time (as does the exercise of other skills). The solitude of working with computers thus becomes a new kind of private space, not an anonymous experience of isolation in a mass medium.⁶

Give me a lever long enough and a place to stand, and I will move the earth.

Archimedes, circa 240 BC

All students should benefit from technology. Currently, new peripherals are being designed to allow those with physical disabilities to operate computers. As technologies become available to a public previously unable to

use computers, this access not only grants people equal opportunities to technology, but enables them to communicate more effectively.

For example, speech synthesis programs give speaking ability to those without the ability to talk. Browsers such as Opera allow screen navigation through the keyboard for those who cannot maneuver a computer mouse. John Roberts, an engineer at the National Institute of Standards and Technology, created a device that has drastically lowered the cost and raised the effectiveness of online reading for the blind. An alternative to machines that produce dimpled paper or contain hundreds of engines for pins that create Braille characters, his device uses three electromagnets to push or pull pins through the machine’s holes mounted on a wheel that rotates at varying speeds, depending on reader speed. This product also is more accurate than screen-reader software, which translates text on a computer screen into synthetic speech, often pronouncing proper names and homonyms poorly.

Computers and the Internet provide constructive methods for learning effectively. A heuristic educational application where students actively explore rather than passively hearing about things lets them discover knowledge for themselves. Teachers intervene to suggest alternative ways of stating problems or methodologies, then leave students to find their own ways to solutions.

For students better suited to learning through experimentation and exploration, self-construction of history through the Web lets them customize history reenactment. Edward L. Ayers, a history professor at the University of Virginia, has spent the past eight years collecting and electronically scanning more than 5,000 photographs, maps, diaries, and other Civil War-related documents dating from 1857 to 1870. His archive, called “Valley of the Shadow: Two Communities in the American Civil War,” chronicles two counties 200 miles apart and on different sides of the war. The counties were

chosen as economically and socially representative of the two sides in the Civil War.

Ayers called the idea of making raw historical documents available electronically “digital history.” He noted, “It changes history from a spectator sport to a participant sport. It’s a move from looking at what other people have thought of history to wrestling with its complexities yourself.”

One of the most powerful aspects of the do-it-yourself history kit is that people can trace connections among records. Users can gain the different perspectives of a relationship between slave and slaveholder, or general and soldier, for example. They could use the database to track the histories of particular individuals after the war and view their wills. The mission statement for “Valley of the Shadow” best describes the usefulness of the resource: “Teachers, scholars, students, and the general public will have a living archive that encompasses the largest problems in American history, presenting not answers for easy consumption but rather open avenues for investigation.”

In a visual culture, it’s important to teach students in a manner that links everyday experiences with their education. As a medium similar to television or video games, the Internet can serve as a learning tool with which students are comfortable. Peter Lyman is a professor at the University of California at Berkeley who studies online education and research. He challenges educators to “explore the educational potential of visual culture, going beyond entertainment by linking the new media to education and democratic culture.”⁷

New after-school programs let students stretch their creative boundaries. Computer chip maker Intel’s Computer Clubhouses frame themselves as “invention workshops” that provide students with access to professional photo, animation, and audio software, letting them create multimedia projects ranging from movies to video games. Located in more than 300 low-income areas with schools or households that may not have such

resources, Intel's program, along with America Online's PowerUp program, gives kids a creative outlet while teaching skills that will doubtless prove important when they look for jobs. The programs also work in conjunction with schools so that kids can use the multimedia technology to supplement their schoolwork. Word of the centers is spreading — one site received more than 300 applications for its 60 openings.

The computer extends the ability for artistic expression to everyone with access. When students express themselves through computer-mediated art, the only limit on resources is the availability of a computer and appropriate applications. A school or after-school program often supplies these, and their ability to support creative expression — unlike with paint or clay — is inexhaustible. You do not run out of virtual paint.

Dewey felt strongly about the arts: They are not only intrinsically and directly enjoyable, but they serve a purpose beyond themselves. They have the office, in increased degree, of all appreciation in fixing taste, in forming standards for the worth of later experiences. They arouse discontent with conditions which fall below their measure; they create a demand for surroundings coming up to their own level. They reveal a depth and range of meaning in experiences which otherwise might be considered mediocre and trivial. They supply, that is, organs of vision. They are not luxuries of education, but emphatic expressions of that which makes any education worthwhile.⁸

The capacity of the computer for extending those who do not feel capable of creating art is limitless. Richard Lanham, an English professor and author at the University of California at Los Angeles has written several books on the evolution of rhetoric and the arts. He noted,

Digitalization of the arts radically democratizes them. The woman who wrote the program that trans-

lates a drawing into music did so because she wanted to open up musical composition to people who had no training or talent for it, but loved it nevertheless.⁹

Facilitating and Furthering Our Democratic Republic

Strong school-district funding translates into strong course offerings. The depth of primary subjects and breadth of electives offered to students used to depend on teacher availability, student majority interest, and fund allocation. With the advent of distance learning programs, access to quality subject matter is quickly becoming less restricted for schools with computers. Lyman noted that the use of the computer as an educational vehicle "contains a principle of justice in the ideal of equal access to communication on a cosmopolitan scale, even if it does not address the issue of the content of education."¹⁰

More frequently, state education systems and large public school districts capitalize on the Internet's ability to provide courses not offered by the school. Microsoft co-founder Paul Allen created Apex Learning, through which students from rural and urban low-income schools in six states take Advanced Placement courses offered over the Internet. The courses offer online textbooks, lessons, class discussions, and chat rooms with students from throughout the country. Accredited teachers provide instruction online. So far, students taking the courses are performing as well as or better than students taking similar courses in classrooms.

The government endorses such programs through U.S. Department of Education grants aimed at increasing the number of low-income students taking Advanced Placement courses. The funding can be used to pay for similar distance education programs, test fees for students, and teacher training.

The Houston Independent School District in Texas has successfully administered the online classes for several years. "When you have a course online, you offer students options," said Gaye Langem, project manager for

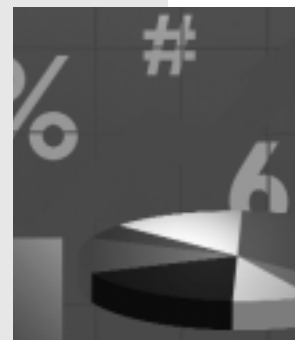
Houston's Virtual School program. She believes that a distinct value of online courses lies in the breadth of offerings a school can provide. She noted, "You can't have a class with five students in it. It's not cost effective." If only a few students are interested in a particular class, the costs to a school are substantially lower if it is offered online. The ability to educate students with interests unsupported by conventional school resources is thus limitless.

However, chip speed and equipment innovation grow in response to the demands of the market, not those of

Growth in Distance Education*

The use of distance education within higher education continues to increase. The percentage of public four-year institutions offering such courses grew from 62 percent in 1995 to 79 percent in 1997, and in public two-year institutions, it rose from 58 to 72 percent. In 1997, an additional 12 percent of public four-year and 19 percent of public two-year institutions planned to offer distance education courses in the following three years. Total enrollment in distance education courses across all postsecondary degree-granting institutions approximately doubled from 1995 to 1997–98, from 754,000 to 1.6 million students.

* Data from "The Condition of Education 2000" (Washington, D.C.: National Center for Education Statistics, 2000).



educators. As companies scramble to invent the fastest processor and quickest connections, the breadth of technology use in the classroom has the capacity to expand. If business becomes less eager to fuel this growth, educational technology development could suffer. This volatile situation should prompt educators to develop resources while technology development offers the means for reaching educational goals. This will better insulate educators from the uncertainties of the market.

Universal access is certainly a precondition to whatever form of democratic education stems from the availability of computer technology in the classroom. Federal and local governments, schools, libraries, and non-profit organizations have made great progress in providing computer and Internet access to those in all corners of society. In 1994, 35 percent of all public schools were connected to the Internet; five years later, access had increased to 95 percent of all public schools.¹¹

According to the 1998 Teaching, Learning, and Computing survey of more than 4,000 teachers, however, the use of computers in classrooms remains, on average, relatively low, and "... computers have not transformed the teaching practices of a majority of teachers, particularly of secondary academic subjects."¹² Black, poor, urban, and rural students are less likely than other students to have access to a home computer, be exposed to higher-order uses of computers in school, and have teachers with the appropriate training in technology. To overcome this discrepancy, school computers in high-poverty areas need to be powerful enough and have connections of sufficient speed to capitalize on online resources.

Computer access alone is not an educational panacea. Educational social change must occur simultaneously with economic change. Too many teachers are unwilling, or untrained, to use new forms of technology, and relatively few teachers use computers for a significant part of

their daily instruction. For computers to increase students' capacity for learning will take more than simply wiring institutions for the Internet. The next generation of teachers must embrace the use of computers in their classrooms; curriculum and instructional materials must integrate technology into day-to-day pedagogy rather than tacking it onto old lesson plans; and students must be educated to critically discern substantive information found online from information that is unreliable. Only when such reforms transform the classroom will the true potential for computer-mediated learning in democratic education be realized.

Thomas Jefferson's educational ideals would have been inconceivable if present-day computer-mediated technologies had been available during the Enlightenment. His narrow parameters for educational distribution would be impossible to implement in the age of computers.

Jefferson was, from a contemporary perspective, distinctly undemocratic in his definition of distributive principles for education. He committed himself to the idea that "it is necessary to rake the geniuses from the rubbish." Recall also that this famous phrase referred only to white males — women and blacks were not part of the formal educational structures Jefferson anticipated.¹³

A modern interpretation of democratic education allows us today to implement an educational agenda that both improves upon and is representative of Jefferson's vision. The depth of his ideal curriculum is now easier to attain — and distribute — thanks to computers. His Enlightenment view of the universe and his concept of the proper education of citizens can be better emulated online. He felt it appropriate that an individual should study history, politics, and economics; would study a number of languages including Latin, Greek, and Hebrew; and would learn about the natural flora and fauna of the United States and of the world. Although it may take some time before quality resources for learning Greek appear on the Web, it seems certain they will.

Jefferson's clear epistemological principles of rationalism and an early form of pragmatism revealed that he believed the autonomous subject will understand and act upon the world — and will have the knowledge to do both. As he articulated, "Everywhere, governments have tendencies towards tyranny." Today, tyrannical governments that attempt to restrict electronic information flow will find their efforts as fruitful as those of Sisyphus in pushing a boulder up a steep hill — fruitless and ineffectual. Inevitably, such previously powerful forces will be rebuffed, and democratic education will become internationally accessible. *C*

Endnotes

1. From the English translation of Alexis de Tocqueville's "Democracy in America," Vol. 1 (New York: Alfred Knopf, 1945).
2. M. McLuhan, "Television: The Timid Giant," *Understanding Media* (New York: McGraw-Hill, 1963), 308–37.
3. J. Dewey, *Philosophy and Civilization* (New York: Minton, Bach & Company, 1931), 318.
4. J. Dewey, *Democracy and Education* (New York: Macmillan Press, 1916), 19.
5. *Ibid.*, 4.
6. S. Turkle, *The Second Self* (New York: Simon and Schuster, 1984).
7. P. Lyman, "Liberal Education in Cyberia," *Re-imagining Liberal Learning in America* (New York: College Entrance Examination Board), 311.
8. Dewey, *Democracy and Education*, 238.
9. R. Lanham, *The Electronic Word* (Chicago, Ill.: University of Chicago Press, 1993), 107.
10. Lyman, 315.
11. "The Condition of Education 2000" (Washington, D.C.: National Center for Education Statistics, 2000).
12. H. Becker, "Findings from the Teaching, Learning, and Computing Survey: Is Larry Cuban Right?" (Washington, DC: January 2000 Technology Leadership Conference of the Council of Chief State School Officers, 2000).
13. R. Cowen, *Nigel Grant and Plato: A Question of Democratic Education* (Oxford, England: Oxford Press, 2000).

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