Dewey and Technology

Editor’s Message

As we think about the changes that the 21st century may bring in educational practices, it’s natural to consider the roles that new information and communication technologies may play. Typically, we identify three kinds of reasons for their use.

One reason often cited is that economic success in information age society appears to demand new skills and new ways of making meaning; thus, there is the need to learn (to use) the new technologies, just as we need to learn language. For many parents, and teachers, too, this appears as the overriding goal for incorporating technologies into learning.

A second reason is that these new technologies promise ways to transform education by offering vast resources for learning and new tools to support inquiry throughout the curriculum; thus, we see the opportunity to learn through new technologies. This is analogous to the argument that once we have learned to read we can read to learn.

A third reason is that intelligent participation in the coming era requires an understanding of the ways that these new technologies are transforming industry, health care, science, language, international relations, and everyday life. Thus, we see the need to learn about new technologies and the ways they permeate life, just as we need to learn about language and its role in social life. The field of social informatics, and programs on science, technology, and society highlight this goal.

In short, there is a parallel to Michael Halliday’s (1978) analysis of the function of language: We need to learn technology, to learn through technology, and to learn about technology.

As we delve deeper into the question of technologies for education, many seek to understand characteristics and implications of new technologies—computational visualization, remote instrumentation, intelligent agents, MOOs and MUDs, collaboratories, telementoring, image processing, virtual reality theaters, embedded systems, speech recognition/generation, intelligent tutors, digital video, wearable computers, and so on. This future-oriented strategy is a necessary component of assessing what capabilities the new technologies afford.

However, there is a past-oriented strategy that may be equally revealing about the shape of future educational practices. This month’s issue calls for a reexamination of foundational ideas in education that may provide insights for efforts to expand and transform education in the coming information age.
Although John Dewey wrote in the late 19th and early 20th century, not the much talked about 21st, his thoughts seem increasingly prescient. As John McDermott (1981) wrote,

[H]is work maintains a creative vitality...the paradox is that Dewey achieved this vitality, not by having written for the future, but rather by writing out of his own present experience...he believed that ordinary experience is seeded with surprises and possibilities for enhancement, if we but allow it to bathe over us in its own terms. (p. x)

This vitality is seen in the fact that many people working to construct technologies for learning now cite Dewey, primarily in terms of his advocacy of learning by doing. They propose models for learning based on immersion in practices of the larger society. This approach would certainly find some support in the progressive education movement that developed from some of Dewey's ideas, but his contribution to the construction of 21st-century education may go much deeper.

Learning by doing. To see this, we first have to understand what Dewey does not say. He wrote little about technologies per se, which may be one reason that his work appears to some to have little relevance to current discussions about 21st-century education. In fact, he did not even have much to say about the dominant educational technology of his day: the book. Despite his being a great scholar and the author of many texts, one has to search to find references in Dewey to books as educational tools.

The references to books in Dewey are implicitly negative. For example, in a discussion of subject matter (1956), which may be taken as a proxy for books, he says, “The map is not a substitute for personal experience. The map does not take the place of the actual journey” (p. 20). In other words, personal experience is at the center of education, not subject matter. There is a role for subject matter: It is to aid in the development of experience and to aid the learner in extracting deeper meaning from future experiences.

What would Dewey have thought about the World Wide Web? Some researchers argue that the new interactive and collaborative learning models delivered through
the Web and other media contrast with the inadequate models of the past that Dewey clearly opposed. Thus, they see a neat equation of

Dewey = learning by doing = constructivism = interconnected, interactive webs of new technologies = 21st-century education = good

standing in opposition to

textbook based = subject-matter driven = stultified teaching of the past = bad

Problems with this simple model. As appealing as this opposition might be, it suffers from three problems. The first is that Dewey might well have applied his critique of book learning to all the new technologies now being proposed as mechanisms for transforming teaching and learning. Dewey would have asked whether ordinary experience had been eliminated as the foundation for learning and, if so, whether the result could be anything but hollow. If, as he claims, education is the search for the structure of experience, then even the most exciting technological interaction might have little meaning in the student’s lived experience.

The second problem is that the opposition trivializes Dewey’s philosophy and thereby misses the insights that his work does provide for thinking about new technologies and education and, more broadly, for technologies and social change.

The third problem is that without specifying the relations among subject matter, media, activity, meaning construction, and experience, the simple opposition obscures what may truly be transformative about the introduction of new technologies for learning.

Technology and learning. There are a number of questions related to technologies and learning, which Dewey’s work may help us answer. Let us consider just one of these this month: Why should we use new technologies for learning? Judging from the statements of U.S. leaders, school administrators, corporate sponsors, and parents’ groups, this is a nonquestion. The only concern is quantity: How fast can we get as much technology as possible into the schools and the workplaces? How quickly can we wire all the schools? How soon can we make everyone technologically literate?

Challenging us to reflect on what we do, Dewey would ask us to pause to think more about how learning through technology serves as a point in the development of experience. In what ways is the experience afforded by interaction with a computer a substitute for other modes of learning? Does it bear the
same relation that the map does to the territory, in which case it may be a feeble abstraction for direct, lived experience? Or, does it provide new avenues for experience and the means to access previously inaccessible realms? Perhaps computer interaction serves best as a means to reflect on, analyze, and extend other experiences? The point here is not that there are simple answers to these questions, but that serious consideration of them may enlarge our understanding of how we may best make use of new technologies and make sense of their impact on students.

Dewey would certainly value learning about new technologies, especially if that were through participation in authentic social practices that use those technologies. Just as in his lab school students learned about raising sheep, shearing them, spinning wool, making cloth and clothes, students today might learn about the many ways that technologies enter into the work and life of society at large. But that learning would have to include critical understanding that continually asks questions such as these: How do these technologies change the nature of language and knowledge? What are the economic consequences, both good and bad, of their use? What do we gain and what do we lose as we move inexorably into the information age?

Finally, Dewey would certainly value learning technology, if it means that students become more capable of participating in society and it enlarges the scope of their abilities to communicate. On the other hand, he might question learning technology if that were conceived merely as preparatory to later life.

Later, we’ll look at additional questions that Dewey may help us examine: Why do we so often discover that new technologies remain underused, misused, and unused? What are the best resources for learning? Where do new technologies fit in the social world of schooling? How can we think about the apparent conflicts between the classroom and the workplace, between learning for today’s needs versus tomorrow’s, between using the technologies of today and those likely to appear in the future?

Website of the Month

Last summer, the American Museum of Natural History in New York selected the first annual Young Naturalist Awards (http://www.amnh.org/science). The Museum created these awards “to recognize excellence in biology, earth science, astronomy and cultural studies in students from grades 7–12.” The competition is administered by the Alliance for Young Artists and Writers, Inc., a nonprofit division of Scholastic.
This year, the awards were based on reports students wrote about a walk through a natural area in their community, an object in their home or classroom, or a species that most people would consider to be a pest. Excerpts from their reports appeared in the June *Natural History* magazine, but to see the full reports with all the photographs and drawings you need to go to the Web. These Web publications and the biodiversity site are good examples of enhancing learning through use of new technologies.

### Websites of the Month: Organizations

Some centers based in the United States concerned with technologies for learning resources:

- **Center for Innovative Learning Technologies** (http://www.cilt.org). This is an alliance of industry, research, schools, and others “to stimulate the development and implementation of important technology-enabled solutions to critical problems in K–14 science, math, and technology learning.”

- **Center for Lifelong Learning and Design**, at the University of Colorado at Boulder (http://www.cs.colorado.edu/~l3d). The goal is “to establish, both by theoretical work and by building prototype systems, the scientific foundations for the construction of intelligent systems that serve as amplifiers of human capabilities (e.g., to expand human memory, augment human reasoning, and facilitate human communication).”

- **Center for Social Informatics**, at Indiana University (http://www-slis.lib.indiana.edu/CSI). The CSI conducts research into information technology and social change.

### Addendum

To: chip@uiuc.edu  
From: Allan Luke  
Date: November 1998  
Subject: Technology and Dewey’s conception of learning
Really enjoyed the Issue section planned for the November technology column—and it got me thinking about where Dewey’s work would stand in relation to the new technologies. You’re right—there’s a tendency to reduce Dewey to “learning by doing” and then assume that the various constructivist approaches forwarded now fit this. One of the things that gets left out is a recognition of Dewey as a pivotal social philosopher and critic (and, at times, exponent) of industrial society.

Two things struck me about your piece—first your mention of Halliday and Dewey together. Both are focused on intellectual technologies as tools for solving problems. The most memorable Dewey I read as an undergraduate was *Art as Experience* (1935a)—where he argues that art and technology are tools for the solution of social and intellectual problems. He defines problems as organism/environment disequilibria, where there are active disruptions of the relationships between people, communities, and their ecological and social environments. This was a cornerstone of his approach to teaching and learning, and it matches well the approach of Paulo Freire (1970) and others working on critical literacy: that teaching and learning need to be problem based; that it requires an analysis of one’s social, cultural, and economic environments; and that it is goal directed toward change and transformation.

So I agree with your point about the “use of new technologies” rather than the technologies themselves being absolutely focal. If we wanted to second-guess what Dewey would say about the new technologies—it strikes me that he would argue that their value depends on the kinds of problems that they’re applied to, and to what ends. (While Halliday would focus on the effects of the technologies on our intellectual practices, processes, and semiotic/linguistic systems; see Halliday & Martin, 1996.)

Second, you also reminded me recently that Dewey would have focused our attention on the relationships between three key elements: the new technologies, what Dewey called “older institutions and habits” (especially those of schooling), and, to use his words, “capitalist economies.” Check out this quote (Dewey, 1935b):

> The conflict is between institutions and habits originating in the pre-scientific and pre-technological age and the new forces generated by science and technology. The application of science, to a considerable degree, even its own growth, has been conditioned by the system to which the name of capitalism is given, a rough designation of a complex of political and legal arrangements centering about a particular mode of economic relations. (p. 75)
So what I’d add is that Dewey would certainly refocus us on the uses of technologies, and on their uses for social problem solving. But he’d also focus us on the economics of the new technologies. It seems to me that teachers and students need to be talking and thinking about these questions: Who is getting access? Which communities of teachers and learners are getting excluded and silenced? and Whose industrial, commercial, and corporate interests are being advanced by the proliferation of these technologies?

I’m not a Luddite (otherwise I wouldn’t be on e-mail so much), but it seems to me that we might be repeating some mistakes we made with print literacy if we rush headlong into teaching and learning programs without building in a critical literacy perspective from day one. Could we call it “critical technological awareness,” following Norman Fairclough’s (1992) “critical language awareness”?  

Glossary

| **Idealization:** | the set of practices originally envisioned for a technology, rather than the realized practices. This is analogous to an intended, as opposed to an enacted, curriculum. |
| **Realization:** | the set of practices associated with actual use of a technology. These may differ markedly from the idealization represented in documentation, a curriculum unit, or a teachers' guide. |
| **Situated evaluation:** | an approach to evaluation of technology use that assumes the technology is not set a priori, but comes into being through use. |
| **Situated studies:** | a research method that explicitly incorporates an analysis of the context in which literacy is practiced or learning occurs. It is particularly appropriate for investigations of the use of new technologies, because users typically find diverse ways to realize their potentials. In fact, to the extent that new technologies for learning truly empower students and teachers, we would expect that they would be used in unexpected ways. |
| **Social informatics:** | the study of how information technologies are used in social contexts, how that use leads to social changes, and, conversely, how social practices influence that use. |
| **Technocentrism:** | a way of thinking about the use of technology that attributes all important changes to the technology itself. |
| **Transaction:** | a phenomenon in which mind and reality, or a “knowing” and the “known,” are conceived as a unified entity; from Dewey and Bentley’s (1949) *Knowing and the Known*. |
REFERENCES