

## Conclusions and Recommendations

*“The fundamental dilemma of computer-based instruction and other IT-based educational technologies is that their cost effectiveness compared to other forms of instruction — for example, smaller class sizes, self-paced learning, peer teaching, small group learning, innovative curricula, and in-class tutors — has never been proven.”*

—U.S. National Science Board,  
Science & Engineering Indicators — 1998.

WHY ARE WE, AS A NATION, SO ENAMORED of computers in childhood? This one-size-fits-all fix for elementary schools does seem to meet a lot of adult needs. It makes politicians and school administrators appear decisive and progressive. It tempts overworked parents and teachers with a convenient, mesmerizing electronic babysitter. And it is irresistible to high-tech companies that hope to boost sales in the educational market.

But a machine-centered approach does not meet the developmental needs of grade-school children. Nor will it prepare them to muster the human imagination, courage, and will power they will as adults need to tackle the huge social and environmental problems looming before us.

Young children are not emotionally, socially, morally, or intellectually prepared to be pinned down to the constraining logical abstractions that computers require. This sedentary approach to learning is also unhealthy for their developing senses and growing bodies.

What’s good for business is not necessarily good for children. We cannot afford educational policies that will expand the market for

Microsoft, Compaq, IBM, Apple, and other companies at children’s expense.

Nor can we afford the delusion that pushing young children to operate the very latest technological gadgets will somehow inoculate them from economic and cultural uncertainties in the future. Nothing can do that — certainly not soon-to-be obsolete skills in operating machines.

In the long term, what will serve them far better is a firm commitment from parents, educators, policymakers, and communities to the remarkably low-tech imperatives of childhood. Those include good nutrition, safe housing, and high-quality health care for every child — especially the one in five now growing up in poverty. They also include consistent love and nurturing for every child; active, imaginative play; a close relationship to the rest of the living world; the arts; handcrafts and hands-on lessons of every kind; and lastly time — plenty of time for children to be children.

A new respect for childhood itself, in other words, is the gift that will best prepare our children for the future’s unknowns. Empowered by this gift, our children can grow into strong,

resilient, creative human beings, facing tomorrow's uncertainties with competence and courage.

Some may fear that our prowess in science and technology will suffer if children are allowed to be children. The opposite is true. Consider the recent Microsoft ad, "Chasing the Future." As companies rapidly turn out one high-tech product after another, it stresses, companies and nations must "constantly replenish their long-term reserves of intellectual capital." Research, Microsoft declares, is the engine driving technical advances. So research, it adds, "has never been more important."<sup>1</sup>

To the extent that's true, then so, too, has childhood never been more important — or more endangered by the current push to transform children into technicians. For childhood is the one period in the human lifespan naturally designed for pursuing the most basic science of all. That's why pushing children instead to produce PowerPoint presentations that mimic the work of adults is shortsighted. It's as shortsighted as Microsoft argues it would be for the United States to pull the plug on basic research and finance only short-term product development.

By supporting basic research, we give our most creative scientists the time they need to play with the fundamental qualities and questions of nature. In periods of great productivity, scientists say, this open-ended creative process can totally dominate their lives — whether they are working, eating, sleeping, or socializing. In short, they live their science. Granted that freedom, they generate the insights that lead to fruitful discoveries, sometimes even paradigm-shifting breakthroughs at the very edges of knowledge.

Childhood, rightly protected, is the same kind of creative process — the same kind of

basic science. Children, too, need time to play with the most fundamental qualities and questions of nature — to "live" them with their whole beings: body, heart, mind, and soul. How closely related this wonder-full quest of childhood is to the expansive spirit of basic science is neatly captured in *The Scientist in the Crib: Minds, Brains, and How Children Learn*: "Our otherwise mysterious adult ability to do science may be a kind of holdover from our infant learning abilities," suggest the authors. "Adult scientists take advantage of the natural human capacities that let children learn so much so quickly. It's not that children are little scientists but that scientists are big children."<sup>2</sup>

Imagination and the spirit of play are crucial to both child and adult forms of "basic science." As the anthropologist Ashley Montague noted, the most creative scientists excel in playing "let's pretend":

The scientist says to himself, "Let me treat this 'as if' it worked that way, and we'll see what happens." He may do this entirely in his head or try it mathematically on paper or physically in the laboratory. What he is doing is using his imagination in much the same way the child does. The truth is that the highest praise one can bestow on a scientist is not to say of him that he is a fact-grubber but that he is a man of imagination. And what is imagination really? It is play — playing with ideas.<sup>3</sup>

The high-tech agenda pushes children to hurry up and become skilled little technicians, experts in "accessing" other people's answers to narrow, technical questions and manipulating machine-generated images. It interrupts the creative process, the basic science, of childhood itself — the playful generation of images from one's own imagination. We do not know what the consequences of such a machine-driven

education in adulthood will be. But we suspect that they will include a narrower and more shallow range of intellectual insights, a stunting of both social and technical imagination, and a drag on the productivity that stems from imaginative leaps. In short, a high-tech agenda for children seems likely to erode our most precious long-term intellectual reserves — our children’s minds.

School reform is a social challenge, not a technological problem. The Education Department’s own 1999 study, “Hope in Urban Education,” offers powerful proof. It tells the story of nine troubled schools in high-poverty areas, all places resigned to low expectations, low achievement, and high conflict — where even the adults bickered and blamed each other. But all transformed themselves into high-achieving, cohesive communities. In the process, everyone involved — principals, teachers, other staff members, parents, and students — developed high expectations of themselves, and of each other.

**The strategies that worked in these schools, the study emphasizes, were persistence, creativity in devising new ways of collaborating, maximizing the attention focused on each child, and a shared commitment to meeting the full range of children’s needs.**

That intensely human approach — not large expenditures on technology — is what seems to have moved all nine communities from despair to hope. Educational technology plays only a relatively minor role in the report. The words “computer” and “technology” do not even appear in the executive summary.

Instead, much credit goes to a new quality in human relationships. “Visitors to these

schools,” the report notes, “quickly sense that teachers and other staff members genuinely love and care for the students.... The improvements in student behavior were also influenced by the changes in the extent to which children came to

understand that they were valued and respected.” In all nine schools, the principals “knew all of the students by name and knew many of the families. The personal relationships among students and

school staff created a powerful context for good behavior.” At all nine schools, parents too became active, engaged, creative partners. This happened because the schools clearly expressed their need and respect for the parents — and because the parents saw “tangible evidence of the school’s concern for their children.”<sup>4</sup>

Larry Cuban, professor of education at Stanford University, has documented how U.S. education policymakers have careened from one new technology to the next — lantern slides, tape recorders, movies, radios, overhead projectors, reading kits, language laboratories, televisions, computers, multimedia, and now the Internet — sure each time that they have discovered educational gold.<sup>5</sup> Eventually, the glimmer always fades, and we find ourselves holding a lump of pyrite — fool’s gold.

Perhaps what we’re looking for is not a technology, not a product to be bought and sold at all. Perhaps the gold is something to be mined and refined within ourselves.

### **Could it be that simple, and that hard?**

Some of the world’s most thoughtful teachers have suggested as much. John Dewey spoke of the eight loves that mark great teachers — love of others, love of being with children, love of knowledge, of communicating knowledge, of a

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particular subject that one has an aptitude for, and love of arousing in others similar intellectual interests, a love of thinking, and the ability to inspire in others one's own love for learning itself.<sup>6</sup>

And Rudolf Steiner, the Austrian innovator, advised, "Accept the children with reverence. Educate them with love. Send them forth in freedom."<sup>7</sup>

Those who place their faith in technology to solve the problems of education should look more deeply into the needs of children. The renewal of education requires personal attention to students from good teachers and active parents, strongly supported by their

communities. It requires commitment to developmentally appropriate education and to the full range of children's real low-tech needs — physical, emotional, and social, as well as cognitive.

M.I.T. Professor Sherry Turkle has asked: "Are we using computer technology not because it teaches best but because we have lost the political will to fund education adequately?"<sup>8</sup> Her question deserves an answer.

In view of the overwhelming evidence summarized here and the urgent needs of our children and schools, the Alliance for Childhood calls for the following actions:

## Recommendations

1. A refocusing in education, at home and school, on the essentials of a healthy childhood: strong bonds with caring adults; time for spontaneous, creative play; a curriculum rich in music and the other arts; reading books aloud; storytelling and poetry; rhythm and movement; cooking, building things, and other handcrafts; and gardening and other hands-on experiences of nature and the physical world.
2. A broad public dialogue on how emphasizing computers is affecting the real needs of children, especially children in low-income families.
3. A comprehensive report by the U.S. Surgeon General on the full extent of physical, emotional, and other developmental hazards computers pose to children.
4. Full disclosure by information-technology companies about the physical hazards to children of using their products.
5. A halt to the commercial hyping of harmful or useless technology for children.
6. A new emphasis on ethics, responsibility, and critical thinking in teaching older students about the personal and social effects of technology.
7. An immediate moratorium on the further introduction of computers in early childhood and elementary education, except for special cases of students with disabilities. Such a time-out is necessary to create the climate for the above recommendations to take place.

1 Microsoft Corporation, "Chasing the Future," advertisement in the *Washington Post*, July 10, 2000, p. A17.

2 Alison Gopnik, Andrew N. Meltzoff, and Patricia K. Kuhl, *The Scientist in the Crib: Minds, Brains, and How Children Learn*, New York: William Morrow, 1999, p. 9.

3 Ashley Montague, *Growing Young*, New York: McGraw-Hill, 1983, pp. 156-157.

4 The Charles A. Dana Center, University of Texas at Austin, "Hope for Urban Education," Washington, DC: U.S. Department of Education Planning and Evaluation Service, 1999.

5 Larry Cuban, *Teachers and Machines: The Classroom Use of Technology Since 1920*, New York: Teachers College Press, 1986.

6 Douglas J. Simpson and Michael J. B. Jackson, "The Multiple Loves of the Successful Teacher: A Deweyan Perspective," *Educational Foundations*, vol. 12, no. 1, Winter 1998, pp.75-82.

7 As quoted by Stephen L. Talbott in *The Future Does Not Compute: Transcending the Machines in Our Midst*, Sebastopol, CA: O'Reilly & Associates, 1995, p. 425.

8 Sherry Turkle, "Seeing Through Computers: Education in a Culture of Simulation," *The American Prospect*, Issue 31, March-April 1997.

