



LOWELL MONKE

Charlotte's Webpage

Why children shouldn't have the world at their fingertips



Thomas Edison was a great inventor but a lousy prognosticator. When he proclaimed in 1922 that the motion picture would replace textbooks in schools, he began a long string of spectacularly wrong predictions regarding the capacity of various technologies to revolutionize teaching. To date, none of them—from film to television—has lived up to the hype. Most were quickly relegated to the audiovisual closet. Even the computer, which is now a standard feature of most classrooms, has not been able to show a consistent record of improving education.

“There have been no advances over the past decade that can be confidently attributed to broader access to computers,” said Stanford University professor of education Larry Cuban in 2001, summarizing the existing research on educational computing. “The link between test-score improvements and computer availability and use is even more contested.” Part of the problem, Cuban pointed out, is that many computers simply go unused in the classroom. But more recent research, including a University of Munich study of 174,000 students in thirty-one countries, indicates

that students who frequently use computers perform worse academically than those who use them rarely or not at all.

Whether or not these assessments are the last word, it is clear that the computer has not fulfilled the promises made for it. Promoters of instructional technology have reverted to a much more modest claim—that the computer is just another tool: “it’s what you do with it that counts.” But this response ignores the ecological impact of technologies. Far from being neutral, they reconstitute all of the relationships in an environment, some for better and some for worse. Installing a computer lab in a school may mean that students have access to information they would never be able to get any other way, but it may also mean that children spend less time engaged in outdoor play, the art supply budget has to be cut, new security measures have to be employed, and Acceptable Use Agreements are needed to inform parents (for the first time in American educational history) that the school is not responsible for the material a child encounters while under its supervision.

The “just-a-tool” argument also ignores the fact that whenever we choose one learning activity over another, we are deciding what kinds of encounters with the world we value for our children, which in turn influences what they grow up to value. Computers tend to promote and support certain kinds of learning experiences, and devalue others. As technology critic Neil Postman has observed, “What we need to consider about computers has nothing to do with its efficiency as a teaching tool. We need to know in what ways it is altering our conception of learning.”

If we look through that lens, I think we will see that educational computing is neither a revolution nor a passing fad, but a Faustian bargain. Children gain unprecedented power to control their external world, but at the cost of internal growth. During the two decades that I taught young people with and about digital technology, I came to realize that the power of computers can lead children into deadened, alienated, and manipulative relationships with the world, that children’s increasingly pervasive use of computers jeopardizes their ability to belong fully to human and biological communities—ultimately jeopardizing the communities themselves.

Several years ago I participated in a panel discussion on Iowa Public Television that focused on some “best practices” for computers in the classroom. Early in the program, a video showed how a fourth grade class in rural Iowa used computers to produce hypertext book reports on *Charlotte’s Web*, E. B. White’s classic children’s novel. In the video, students proudly demonstrated their work, which included a computer-generated “spider” jumping across the screen and an animated stick-figure boy swinging from a hayloft rope. Toward the end of the video, a student discussed the important lessons he had learned: always be nice to each other and help one another.

There were important lessons for viewers as well. Images of the students talking around computer screens dispelled (appropriately, I think) the notion that computers always isolate users. Moreover, the

teacher explained that her students were so enthusiastic about the project that they chose to go to the computer lab rather than outside for recess. While she seemed impressed by this dedication, it underscores the first troubling influence of computers. The medium is so compelling that it lures children away from the kind of activities through which they have always most effectively discovered themselves and their place in the world.

Ironically, students could best learn the lessons implicit in *Charlotte’s Web*—the need to negotiate relationships, the importance of all members of a community, even the rats—by engaging in the recess they missed. In a school, recess is not just a break from intellectual demands or a chance to let off steam. It is also a break from a closely supervised social and physical environment. It is when children are most free to negotiate their own relationships, at arm’s length from adult authority. Yet across the U.S., these opportunities are disappearing. By the year 2000, according to a 2001 report by University of New Orleans associate professor Judith Kiehl, more than 40 percent of the elementary and middle schools in the U.S. had entirely eliminated recess. By contrast, U.S. Department of Education statistics indicate that spending on technology in schools increased by more than 300 percent from 1990 to 2000.

Structured learning certainly has its place. But if it crowds out direct, unmediated engagement with the world, it undercuts a child’s education. Children learn the fragility of powers by

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touching their petals. They learn to cooperate by organizing their own games. The computer cannot simulate the physical and emotional nuances of resolving a dispute during kickball, or the creativity of inventing new rhymes to the rhythm of jumping rope. These full-bodied, often deeply heartfelt experiences educate not just the intellect but also the soul of the child. When children are free to practice on their own, they can test their inner perceptions against the world around them, develop the qualities of care, self-discipline, courage, compassion, generosity, and tolerance—and gradually figure out how to be part of both social and biological communities.

It's true that engaging with others on the playground can be a harrowing experience, too. Children often need to be monitored and, at times, disciplined for acts of cruelty, carelessness, selfishness, even violence. Computers do provide an attractively reliable alternative to the dangers of unsupervised play. But schools too often use computers or other highly structured activities to prevent these problematic qualities of childhood from surfacing—out of fear or a compulsion to force-feed academics. This effectively denies children the practice and feedback they need to develop the skills and dispositions of a mature person. If children do not dip their toes in the waters of unsupervised social activity, they likely will never be able to swim in the sea of civic responsibility. If they have no opportunities to dig in the soil, discover the spiders, bugs, birds, and plants that populate even the smallest unpaved playgrounds, they will be less likely to explore, appreciate, and protect nature as adults.

Computers not only divert students from recess and other unstructured experiences, but also replace those authentic experiences with virtual ones, creating a separate set of problems. According to surveys by the Kaiser Family Foundation and others, school-age children spend, on average, around seven hours a day in front of screens for recreational purposes (for children ages two to seven the average is around three hours). All that screen time is supplemented by the hundreds of impressive computer projects now taking place in schools. Yet these projects—the steady diet of virtual trips to the Antarctic, virtual climbs to the summit of Mount Everest, and trips into cyber-orbit that represent one technological high after another—generate only vicarious thrills. The student doesn't actually soar above the Earth, doesn't trek across icy terrain, doesn't climb a mountain. Increasingly, she isn't even allowed to climb to the top of the jungle gym. And unlike reading, virtual adventures leave almost nothing to, and therefore require almost nothing of, the imagination. In experiencing the virtual world, the student cannot, as philosopher Steve Talbot has put it, "connect to [her] inner essence."

On the contrary, she is exposed to a simulated world that tends to deaden her encounters with the real one. During the

decade that I spent teaching a course called Advanced Computer Technology, I repeatedly found that after engaging in Internet projects, students came back down to the Earth of their immediate surroundings with boredom and disinterest—and a desire to get back online. This phenomenon was so pronounced that I started kidding my students about being BEJs: Big Event Junkies. Sadly, many readily admitted that, in general, their classes had to be conducted with the multimedia sensationalism of MTV just to keep them engaged. Having watched Discovery Channel and worked with computer simulations that severely compress both time and space, children are typically disappointed when they first approach a pond or stream: the fish aren't jumping, the frogs aren't croaking, the deer aren't drinking, the otters aren't playing, and the raccoons (not to mention bears) aren't shopping. Their electronic experiences have led them to expect to see these things happening—all at once and with no effort on their part. This distortion can also result from a diet of television and movies, but the computer's powerful interactive capabilities greatly accelerate it. And the phenomenon affects more than just experiences with the natural world. It leaves students apathetic and impatient in any number of settings—from class discussions to science experiments. The result is that the child becomes less animated and less capable of appreciating what it means to be alive, what it means to belong in the world as a biological, social being.

So what to make of the *Charlotte's Web* video, in which the students hunch over a ten-by-twelve-inch screen, trying to learn about what it means to be part of a community while the recess clock ticks away? It's probably unfair to blame the teacher, who would have had plenty of reasons to turn to computers. Like thousands of innovative teachers across the U.S., she must try to find alternatives to the mind-numbing routine of lectures, worksheets, and rote memorization that constitutes conventional schooling. Perhaps like many other teachers, she fully acknowledges the negative effects of computer instruction as she works to create something positive. Or her instructional choices may have simply reflected the infatuation that many parents, community leaders, school administrators, and educational scholars have had with technology. Computer-based education clearly energizes many students and it seems to confer children tremendous power. Unfortunately, what it strips away is much less obvious.

When I was growing up in rural Iowa, I certainly lacked for many things. I couldn't tell a bagel from a burrito. But I always and in many ways belonged. For children, belonging is the most important function a community serves. Indeed, that is the message that lies at the heart of *Charlotte's Web*. None of

us—whether of barnyard or human society—thrives without a sense of belonging. Communities over it in many different ways—through stories, through language, through membership in religious, civic, or educational organizations. In my case, belonging hinged most decisively on place. I knew our farm—where the snowdrifts would be the morning after a blizzard, where and when the spring runoff would create a temporary stream through the east pasture. I knew the warmest and coolest spots. I could tell you where I was by the smells alone. Watching a massive thunderstorm build in the west, or discovering a new litter of kittens in the barn, I would be awestruck, mesmerized by mysterious wonders I could not control. One of the few moments I remember from elementary school is watching a huge black-and-yellow garden spider climb out of Lee Anson's pants after we came back from a field trip picking wildflowers. It set the whole class in motion with lively conversation and completely dumfounded our crusty old teacher. Somehow that spider spoke to all of us wide-eyed third graders, and we couldn't help but speak back. My experience of these moments, even if often only as a caring observer, somehow solidified my sense of belonging to a world larger than myself—and prepared me, with my parents' guidance, to participate in the larger community, human and otherwise.

Though the work of the students in the video doesn't reflect it, this kind of experience plays a major role in E. B. White's story. *Charlotte's Web* beautifully draws a child's attention to something that is increasingly rare in schools: the wonder of ordinary processes of nature, which grows mainly through direct contact with the real world. As Hannah Arendt and other observers have noted, we can only learn who we are as human beings by encountering what we are not. While it may seem an impossible task to provide all children with access to truly wild territories, even digging in (healthy) soil opens up a micro-universe that is wild, diverse, and "alien." Substituting the excitement of virtual connections for the deep fulfillment of firsthand engagement is like mistaking a map of a country for the land itself, or as biological philosopher Gregory Bateson put it, "eat[ing] the menu instead of your meal." No one prays over a menu. And I've never witnessed a child developing a reverence for nature while using a computer.

There is a profound difference between learning **from** the world and learning **about** it. Any young reader can find a surfeit of information about worms on the Internet. But the computer can only teach the student **about** worms, and only through abstract symbols—images and text cast on a two-dimensional screen. Contrast that with the way children come to know worms by hands-on experience—by digging in the soil, watching the worm retreat into its hole, and of course feeling it wig-

gle in the hand. There is the delight of discovery, the dirt under the fingernails, an initial squeamishness followed by a sense of pride at overcoming it. This is what can infuse knowledge with reverence, taking it beyond simple ingestion and manipulation of symbols. And it is reverence in learning that inspires responsibility to the world, the basis of belonging. So I had to wonder why the teacher from the *Charlotte's Web* video asked children to create animated computer pictures of spiders. Had she considered bringing terrariums into the room so students could watch real spiders busily spinning real webs? Sadly, I suspect not.

Rather than attempt to compensate for a growing disconnect from nature, schools seem more and more committed to reinforcing it, a problem that began long before the use of computers. Western pedagogy has always favored abstract knowledge over experiential learning. Even relying on books too much or too early inhibits the ability of children to develop direct relationships with the subjects they are studying. But because of their power, computers drastically exacerbate this tendency, leading us to believe that vivid images, massive amounts of information, and even online conversations with experts provide an adequate substitute for conversing with the things themselves.

As the computer has amplified our youths' ability to virtually "go anywhere, at any time," it has eroded their sense of belonging anywhere, at any time, to anybody, or for any reason. How does a child growing up in Kansas gain a sense of belonging when her school encourages virtual learning about Afghanistan more than firsthand learning about her hometown? How does she relate to the world while spending most of her time engaging with computer-mediated text, images, and sounds that are oddly devoid of place, texture, depth, weight, odor, or taste—empty of life? Can she still cultivate the qualities of responsibility and reverence that are the foundation of belonging to real human or biological communities?

During the years that I worked with young people on Internet telecollaboration projects, I was constantly frustrated by individuals and even entire groups of students who would suddenly disappear from cyber-conversations related to the projects. My own students indicated that they understood the departures to be a way of controlling relationships that develop online. If they get too intense, too nasty, too boring, too demanding, just stop communicating and the relationship goes away. When I inquired, the students who used e-mail regularly all admitted they had done this, the majority more than once. This avoidance of potentially difficult interaction also surfaced in a group of students in the "Talented and Gifted" class at my school. They preferred discussing cultural diversity with students on the other side of the world through the Internet rather

than conversing with the school's own ESL students, many of whom came from the very same parts of the world as the online correspondents. These bright high school students feared the uncertain consequences of engaging the immigrants face-to-face. Would they want to be friends? Would they ask for favors? Would they embarrass them in front of others? Would these beginning English speakers try to engage them in frustrating conversations? Better to stay online, where they could control when and how they related to strange people—without much of the work and uncertainty involved with creating and maintaining a caring relationship with a community.

If computers discourage a sense of belonging and the hard work needed to interact responsibly with others, they replace it with a promise of power. The seduction of the digital world is strong, especially for small children. What sets the computer apart from other devices, such as television, is the element of control. The most subtle, impressive message promoted by the *Charlotte's Web* video was that children could take charge of their own learning. Rather than passively listening to a lecture, they were directly interacting with educational content at their own pace. Children, who have so little control over so many things, often respond enthusiastically to such a gift. They feel the same sense of power and control that any of us feels when we use the computer successfully.

To develop normally, any child needs to learn to exert some control over her environment. But the control computers offer children is deceptive, and ultimately dangerous. In the first place, any control children obtain comes at a price: relinquishing the uniquely imaginative and often irrational thought processes that mark childhood. Keep in mind that a computer always has a hidden pedagogue—the programmer—who designed the software and invisibly controls the options available to students at every step of the way. If they try to think “outside the box,” the box either refuses to respond or replies with an error message. The students must first surrender to the computer's hyper-rational form of “thinking” before they are awarded any control at all.

And then what exactly is awarded? Here is one of the most underappreciated hazards of the digital age: the problematic

nature of a child's newfound power—and the lack of internal discipline in using it. The child pushes a button and the computer draws an X on the screen. The child didn't draw that X, she essentially “ordered” the computer to do it, and the computer employed an enormous amount of embedded adult skill to complete the task. Most of the time a user forgets this distinction because the machine so quickly and precisely processes commands. But the intensity of the frustration that we experi-

ence when the computer suddenly stops following orders (and our tendency to curse at, beg, or sweet talk it) confirms that the subtle difference is not lost on the psyche. This shift toward remote control is akin to taking the child out of the role of actor and turning her into the director. This is a very different way of engaging the world than hitting a ball, building a fort, set-

ting a table, climbing a tree, sorting coins, speaking and listening to another person, acting in a play. In an important sense, the child gains control over a vast array of complex abstract activities by giving up or eroding her capacity to actually do them herself. We bemoan the student who uses a spell-checker instead of learning to spell, or a calculator instead of learning to add. But the sacrifice of internal growth for external power generally operates at a more subtle level, as when a child assembles a PowerPoint slideshow using little if any material that she actually created herself.

Perhaps more importantly, however, this emphasis on external power teaches children a manipulative way of engaging the world. The computer does an unprecedented job of facilitating the manipulation of symbols. Every object within the virtual environment is not only an abstract representation of something tangible, but is also discrete, floating freely in a digital sea, ready at hand for the user to do with as she pleases. A picture of a tree on a computer has no roots in the earth; it is available to be dragged, cropped, shaded, and reshaped. A picture of a face can be distorted, a recording of a musical performance remixed, someone else's text altered and inserted into an essay. The very idea of the dignity of a subject evaporates when everything becomes an object to be taken apart, reassembled, or deleted. Before computers, people could certainly abstract and manipulate symbols of massive objects or living things, from trees to

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mountainsides, from buildings to troop movements. But in the past, the level of manipulative power found in a computer never rested in the hands of children, and little research has been done to determine its effect on them. Advocates enthuse over the “unlimited” opportunities computers afford the student for imaginative control. And the computer environment attracts children exactly because it strips away the very resistance to their will that so frustrates them in their concrete existence. Yet in the real world, it is precisely an object’s resistance to unlimited manipulation that forces a child (or anyone) to acknowledge the physical limitations of the natural world, the limits of one’s power over it, and the need to respect the will of others living in it. To develop normally, a child needs to learn that she cannot force the family cat to sit on her lap, make a rosebud bloom, or hurt a friend and expect to just start over again with everything just as it was before. Nevertheless, long before children have learned these lessons in the real world, parents and educators rush to supply them with digital tools. And we are only now getting our first glimpse of the results—even among teenagers, whom we would expect to have more maturity than their grade school counterparts.

On the day my Advanced Computer Technology classroom got wired to the Internet, it suddenly struck me that, like other technology teachers testing the early Internet waters, I was about to give my high school students more power to do more harm to more people than any teens had ever had in history, and all at a safe distance. They could inflict emotional pain with a few keystrokes and never have to witness the tears shed. They had the skill to destroy hours, even years, of work accomplished by others they didn’t know or feel any ill-will toward—just unfortunate, poorly protected network users whose shells provided convenient bull’s-eyes for youth flexing their newfound technical muscles. Had anyone helped them develop the inner moral and ethical strength needed to say “no” to the flexing of that power?

On the contrary, we hand even our smallest children enormously powerful machines long before they have the moral capacities to use them properly. Then to assure that our children don’t slip past the electronic fences we erect around them, we rely on yet other technologies—including Internet filters like Net Nanny—or fear of draconian punishments. This is not the way to prepare youth for membership in a democratic society that eschews authoritarian control.

That lesson hit home with particular force when I had to handle a trio of very bright high school students in one of the last computer classes I taught. These otherwise nice young men lobbied me so hard to approve their major project proposal—breaking through the school’s network security—that I finally relented

to see if they intended to follow through. When I told them it was up to them, they trotted off to the lab without a second thought and went right to work—until I hauled them back and reasserted my authority. Once the external controls were lifted, these teens possessed no internal controls to take over. This is something those who want to “empower” young children by handing them computers have tended to ignore: that internal moral and ethical development must precede the acquisition of power—political, economic, or technical—if it is to be employed responsibly.

Computer science pioneer Joseph Weizenbaum long ago argued that as the machines we put in our citizens’ hands become more and more powerful, it is crucial that we increase our efforts to help people recognize and accept the immense responsibility they have to use those machines for the good of humanity. Technology can provide enormous assistance in figuring out **how** to do things, Weizenbaum pointed out, but it turns mute when it comes time to determine **what** we should do. Without any such moral grounding, the dependence on computers encourages a manipulative, “whatever works” attitude toward others. It also reinforces the exploitative relationship to the environment that has plagued Western society since Descartes first expressed his desire to “seize nature by the throat.” Even sophisticated “environmental” simulations, which show how ecosystems respond to changes, reinforce the mistaken idea that the natural world conforms to our abstract representations of it, and therefore has no inherent value, only the instrumental value we assign to it through our symbols. Such reductionism reinforces the kind of faulty thinking that is destroying the planet: we can dam riparian systems if models show an “acceptable” level of damage, treat human beings simply as units of productivity to be discarded when inconvenient or useless, and reduce all things, even those living, to mere data. The message of the medium—abstraction, manipulation, control, and power—inevitably influences those who use it.

None of this happens overnight, of course, or with a single exposure to a computer. It takes time to shape a worldview. But that is exactly why it is wrong-headed to push such powerful worldview-shapers on impressionable children, especially during elementary school years. What happens when we immerse our children in virtual environments whose fundamental lesson is not to live fully and responsibly in the world, but to value the power to manipulate objects and relationships? How can we then expect our children to draw the line between the symbols and what they represent? When we remove resistance to a child’s will to act, how can we teach that child to deal maturely with the Earth and its inhabitants?

Our technological age requires a new definition of maturity: coming to terms with the proper limits of one’s own

power in relation to nature, society, and one's own desires. Developing those limits may be the most crucial goal of twenty-first-century education. Given the pervasiveness of digital technology, it is not necessary or sensible to teach children to reject computers (although I found that students need just one year of high school to learn enough computer skills to enter the workplace or college). What is necessary is to confront the challenges the technology poses with wisdom and great care. A number of organizations are attempting to do just that. The Alliance for Childhood, for one, has recently published a set of curriculum guidelines that promotes an ecological understanding of the relationship between humans and technology. But that's just a beginning.

In the preface to his thoughtful book *The Whale and the Reactor* Langdon Winner writes, "I am convinced that any philosophy of technology worth its salt must eventually ask, 'How can we limit modern technology to match our best sense of who we are and the kind of world we would like to build?'" Unfortunately, our schools too often default to the inverse of that question: How can we limit human beings to match the best use of what our technology can do and the kind of world it will build? As a consequence, our children are likely to sustain this process of alienation—in which they treat themselves, other people, and the Earth instrumentally—in a vain attempt to materially >ll up lives crippled by internal emptiness. We should not be surprised when they "solve" personal and social problems by turning to drugs, guns, hateful Web logs, or other powerful "tools," rather than digging deep within themselves or searching out others in the community for strength and support. After all, this is just what we have taught them to do.

At the heart of a child's relationship with technology is a paradox—that the more external power children have at their disposal, the more difficult it will be for them to develop the inner capacities to use that power wisely. Once educators, parents, and policymakers understand this phenomenon, perhaps education will begin to emphasize the development of human beings living in community, and not just technical virtuosity. I am convinced that this will necessarily involve unplugging the learning environment long enough to encourage children to discover who they are and what kind of world they must live in. That, in turn, will allow them to participate more wisely in using external tools to shape, and at times leave unshaped, the world in which we all must live. a

This article was supported by Orion's Thoughts on America Fund.

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I'm 62

BY TOM CRAWFORD

Another day ignorant.

Here comes the sun anyway.

So beautiful I could just pee my pants.

Frost wore diapers after 70

his daughter told his biographer

he'd get so excited.

It doesn't get easier.

I just filleted a yellow perch

I caught an hour ago in the bay.

Its lone gut unfolded

like origami,

one sandshrimp after another.

You see what I mean?

I live alone to spare myself,

another, the intensity of feelings

even a little bird brings on

eating the bread crumbs

I put out the night before.