The Overdominance of Computers

The debate churns on over the effectiveness of computers as learning tools. Although there is a growing disillusionment with the promise of computers to revolutionize education, their position in schools is protected by the fear that without them students will not be prepared for the demands of a high-tech 21st century. This fallback argument ultimately trumps every criticism of educational computing, but it is rarely examined closely.

Let’s start by accepting the premise of the argument: Schools need to prepare young people for a high-tech society. Does it automatically follow that children of all ages should use high-tech tools? Most people assume that it does, and that’s the end of the argument. But we don’t prepare children for an automobile-dependent society by finding ways for 10-year-olds to drive cars, or prepare people to use alcohol responsibly by teaching them how to drink when they are 6. My point is that preparation does not necessarily warrant early participation. Indeed, preparing young people quite often involves strengthening their inner resources—like self-discipline, moral judgment, and empathy—before giving them the opportunity to participate.

Great Power and Poor Preparation

The more powerful the tools—and computers are powerful—the more life experience and inner strength students must have to handle that power wisely. On the day my Advanced Computer Technology classroom got wired to the Internet, it struck me that I was about to give my high school students great power to harm a lot of people, and all at a safe distance. They could inflict emotional pain with a few keystrokes and never have to witness the tears shed. They could destroy hours of work accomplished by others who were not their enemies—just poorly protected network users whose files provided convenient bull’s-eyes for youth flexing newfound technical muscles.

I also realized that it would take years to instill the ethical discipline needed to say no to flexing that technical power. Young people entering my course needed more firsthand experiences guided by adults. They needed more chances to directly connect their own actions with the consequences of those actions, and to reflect on the outcomes, before they started using tools that could trigger serious consequences on the other side of the world.

Students need more than just moral preparation. They also need authentic experiences. As more students grow up spending much of their time in environments dominated by computers, TV, and video games, their diminished experience with real, concrete things prevents them from developing a rich understanding of what they study on computers. The computer is a purely symbolic environment; users are always working with abstract representations of things, never with the things themselves. In a few months my students could learn to build complex relational databases and slick multimedia presentations. But unless they also had a deep knowledge of the physical world and community relationships, they would be unable to infuse depth and meaning into the information they were depicting and discussing.

Do Computers Help Achievement?

Educational technology researchers, who tend to suffer from a severe inability to see the forest for the trees, typically ignore the impact that saturating society with computers and other screen environments is having on children. University of Munich economists Thomas Fuchs and Ludger Woessmann recently examined data from a study of 174,000 15-year-olds in 31 nations who took the Programme for International Student Assessment tests. They found, after controlling for other possible influences, that the more access students had to computers in school and at home, the lower their overall test scores were (2004). The authors suggest that rather than inherently motivating young people or helping them learn, computers more likely distract them from their studies. But there may be other problems behind this phenomenon that point to inherent contradictions in the use of educational technology.

For example, although we know that computer programs can help small children learn to read, we also know that face-to-face interaction is one of the most important ingredients in reading readiness (Dodici, Draper, & Peterson, 2003). As a result of increased time spent with computers, video games, and TV, the current generation of elementary students will experience an estimated 30 percent fewer face-to-face encounters than the previous generation (Hammel, 1999). Thus, teachers may be employing the very devices for remediating reading problems that helped cause the problems in the first place.

The issue is not just balancing computer time with other activities in schools. Both inside and outside school, children’s lives are dominated by technology. Nearly everything a child does today—from chatting with friends to listening to music to playing games—tends to involve the use of technologies that distance children from direct contact with the living world. If the task of schools is to produce men and women who live responsible, fulfilling lives—not just human cogs for the high-tech machinery of commerce—then we should not be intensifying children’s high-tech existence but compensating for it. Indeed, as advanced technology increasingly draws us toward a mechanical way of thinking and acting, it becomes crucial that schools help students develop their distinctly human capacities.

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balance in using high technology, but an effort to balance children’s machine-dominated lives.

To prepare children to challenge the cold logic of the spreadsheet-generated bottom line, we need to teach them to value what that spreadsheet cannot factor in: commitment, loyalty, and tradition. To prepare them to find meaning in the abstract text and images encountered through screens, we need to first engage them in physical realities that screen images can only symbolize. To fit students to live in an environment filled with human-made products, we need to first help them know and respect what cannot be manufactured: the natural, the living, the wild. To prepare students to live well-grounded lives in a world of constant technological change, we need to concentrate their early education on things that endure.

The Cost of Failing to Compensate

Anyone who has spent time in schools knows that what is keeping today’s youth from succeeding academically has nothing to do with a lack of technical skills or access to computers. Rather, it is the lack of qualities like hope, compassion, trust, respect, a sense of belonging, moral judgment, stability, community support, parental care, and teacher competence and enthusiasm that keeps so many students imprisoned in ignorance.

Ironically, what students will most need to meet the serious demands of the 21st century is the wisdom that grows out of these inner human capacities and that is developed by community involvement. If the 20th century taught us anything at all, it should have been that technology can be a very mixed blessing. Children entering elementary schools today will eventually have to wrestle with the mess that their elders have left them because of our own lack of wisdom about technology’s downside: global warming, increasingly lethal weapons, nuclear waste, overdependence on automobiles, overuse of pesticides and antibiotics, and the general despoiling of our planet. They will also have to take on ethical conundrums posed by advanced technology, such as what to do about cloning, which decisions are off-limits to artificial intelligence devices, and whether or not parents should be allowed to “enhance” the genetic makeup of their offspring (only the wealthy need apply).

Those decisions should not be left to technicians in labs, CEOs in boardrooms, or politicians in debt to those who stand to profit from the technology. Our children should be at the decision tables as adults, and we want them to be able to stand apart from high technology and soberly judge its benefits and detriments to the entire human race.

How can young people develop the wisdom to judge high technology if they are told from the moment they enter school, implicitly if not explicitly, that they need high-tech tools to learn, to communicate, to think? Having been indoctrinated early with the message that their capacity to deal with the world depends not on their own internal resources but on their use of powerful external machines, how can students even imagine a world in which human beings impose limits on technological development or use?

Where to Go from Here

Keep to Essentials in the Early Years

So how, specifically, should educators make decisions and policies about the appropriateness of digital technologies for students of different ages?

One approach to tackling this dilemma comes from the Alliance for Childhood. During the last eight years, the Alliance (whose board of directors I serve on) has engaged educators, children’s health professionals, researchers, and technology experts in developing guidelines for structuring a healthy learning environment for children, and has developed a list of essential conditions. Educators should ask themselves to what extent heavy use of computers and the Internet provides children in the lower grades with these essential solutions has not be left to technicians in labs, CEOs in boardrooms, or politicians in debt to those who stand to profit from the technology. Our children’s should be at the decision tables as adults, and we want them to be able to stand apart from high technology and soberly judge its benefits and detriments to the entire human race.

This vision places a high priority on a child’s direct encounters with the world and with other living beings, but it does not reject technology. On the contrary, tools are an important pan of the vision. But at the elementary level, the tools should be simple, putting less distance between the student and the world and calling forth the student’s own internal resources.

Schools must also be patient with children’s development. It would strike anyone as silly to give the smallest student in a 2nd grade class a scooter so that the child could get around the track as fast as the other kids his or her age. But our society shows decreasing willingness to wait for the natural emergence of students’ varying mental and emotional capacities. We label students quickly and display an almost pathological eagerness to apply external technical fixes (including medications) to students who often simply aren’t ready for the abstract, academic, and sedentary environment of today’s early elementary classrooms. Our tendency to turn to external tools to help children cope with demands that are out of line with their tactile and physically energetic nature reflects the impact that decades of placing faith in technical solutions has had on how we treat children.

Study Technology in Depth after Elementary School

After children have had years to engage in direct, firsthand experiences, and as their abstract thinking capacities emerge more fully, it makes sense to gradually introduce computers and other complex, symbolic environments. Computer
hardware and software should also become the focus of classroom investigation. A student in a technological society surrounded by black boxes whose fundamental principles he or she does not understand is as functionally illiterate as a student in a world filled with books that he or she can't read. The only thing worse would be to make technology "invisible," preventing children from even being aware of their ignorance.

By high school, digital technologies should take a prominent place in students' studies, both as tools of learning and as tools to learn about. During the last two years of high school, teachers should spend considerable time outfitting students with the high-tech skills they will need when they graduate. This "just-in-time" approach to teaching technical skills is far more efficient—instructationally and financially—than continually retraining younger students in technical skills soon to be obsolete. In addition, students at all education levels should consciously examine technology's role in human affairs.

I am not suggesting that we indiscriminately throw computers out of classrooms. But I do believe it's time to rethink the past decision to indiscriminately throw them in. The result of that rethinking would be, I hope, some much-needed technological modesty, both in school and eventually in society in general. By compensating for the dominance of technology in students' everyday lives, schools might help restore the balance we need to create a more humane society.

The irony of postmodern education is that preparing children for a high-tech future requires us to focus our attention more than ever before on the task of understanding what it means to be human, to be alive, to be part of both social and biological communities—a quest for which technology is increasingly becoming not the solution but the problem.

References

