

Digital Heretics or Voices of Reason?

A seminar examining some dissenting views on the use of IT in education

Presented by

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[Whilst the presenter of this paper compiled the information contained in it, he wishes to state that he has used the words of many people particularly the subjects of his presentation.]

"...there is no clear, commanding body of evidence that students' sustained use of multimedia machines, the Internet, word processing, spreadsheets, and other popular applications has any impact on academic achievement."

Larry Cuban

Over the past 20 years, Information Technology (IT) has become an integral part of schools and classrooms. In fact so commonplace has it become, particularly in wealthier western countries, that to question the educational value of IT might be considered by some an act of educational heresy. So all pervasive is the influence of this technology, that it is possible to lose sight of the fact that there is a significant voice of dissent on the current practice of integrating IT into schools.

As participants in a conference entitled "Information Literacy Across the IB Programmes" it is likely that we are all fairly accepting of the value of technology in education. Indeed many of us, myself included, may be responsible for "leading the charge" to expand the role of IT in our schools. There is, however, a danger in simply dismissing those who question or even oppose the spread of educational technology as neo-luddites or technophobes.

There is a growing band of educationalists who are seriously questioning the push of IT into schools. Many go well beyond questioning and call for an outright ban on IT in schools. Who are these people and why are they so opposed to the use of computer technology in education?

The aim of this seminar is to present the views of some of the leading educational IT dissidents. You may not like it, you may not agree with it, but you should at least, hear what they have to say. Much of it is interesting and some of it quite compelling, it may even give you cause to rethink what it is you are trying to do with IT in your school.

Much of what I will present to today is not mine. I am happy to tell you that I have taken the words of others and tried to package them into a coherent form that I hope you will find both informative and interesting.

Wherever possible I will be presenting the words of my subjects as direct quotes, although for brevity sake (some of them do go on a bit) I have chosen to summarize into more concise points. I am going to try to present their arguments as neutrally as I can although I warn you in advance that I just may let slip what I actually think of some of it, particularly the sillier stuff... and trust me there are some odd ideas indeed about computers in schools out there, so be prepared.

I guess before I go any further I should introduce myself. As you may have seen in the programme, my name is Kevin Whitmore. I work at the Osaka International School in Osaka Japan. I teach a range of IT subjects ~ MYP Design tech and Info Tech in the middle school grades 6 to 10, in the high school I teach

ITGS and Multimedia. I built and maintain the school website, I create the school yearbook and in my spare time run the school's TV station.

I've been a teacher for more than 25 years and for the last 20 years I've taught IT in most of its various guises, the last five years as IB subjects.

I first explored the arguments of those who question and/or oppose the use of IT in schools as part of study for my masters Degree a few years back and was surprised by the sheer volume of people who were prepared to stand up and voice their opposition to the use of computers in schools. I was also taken by the passion with which they do this. Most of them are far more passionate in their stand against computers that I've ever been in my role to encourage their use.

It's a bit of an odd idea that people can become so caught up in a hatred of computers, I wonder if there are similar movements in other subject areas ~ are there groups opposed to the use of the piano in music lessons? Are there eminent physicians fighting against the use of Bunsen burners in laboratories? Are there protest movements trying to drive books out of school libraries? What is it about computers that have been getting so many people so riled?

If I could use a bit of a religious analogy... as participants in a IT convention, I am going to assume that most us might be considered "believers", even "true believers" in the benefit of IT for education, some of us may even be ranked as downright evangelical, but my talk today concerns itself with those who question this faith... the IT agnostics and those who reject it out of hand... the IT atheists.

The positions these people take range along a continuum of opposition, from those who generally accept the idea of using IT in schools but are critical of the current practices, to those who question the high costs when compared to the little or no observable benefit, to those who are concerned about the curriculum cuts that occur to make room for the inclusion of IT, to those who worry about the damage that IT does to students; socially, emotionally, physiologically and even physically and then finally to those who claim that computers are an agent for globalization and the transfer of western industrial ideology which they claim is responsible not only reducing cultural diversity but leading to the destruction of the environment by climate change. (More about these atheists later)

Before I speak about any individual I want to begin by talking to you about an organization that has spread across the USA and now has chapters in Europe and elsewhere... perhaps coming to a school district near you... Elementary school IT teachers - be afraid... I present for you, *The Alliance for Childhood*

The Alliance for Childhood

“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 attention to the full range of children’s real low-tech needs — physical, emotional, and social, as well as cognitive.”

The high-tech, screen-centered lifestyle of today's children is a health hazard running against the education they need to take part in making ethical choices in a high-tech democracy, or so says the Alliance for Childhood (AFC), a nonprofit children's advocacy group.

The AFC have published a number of reports, articles and books which slam education standards and industry assertions that all teachers and children, from preschool up, should use computers in the classroom for technology literacy, an expensive agenda which ignores evidence that high-tech classrooms did little if anything for student achievement.

The AFC strongly criticizes the extensive financial and political connections between education officials and school technology vendors. It urges citizens to wake up to the increasing influence of corporations in policymaking for public education.

According to the AFC "The lack of evidence or an expert consensus that computers will improve student achievement—despite years of efforts by high-tech companies and government agencies to demonstrate otherwise—is itself compelling evidence of the need for change,". "It's time to scrap ... national, state, and local policies that require all students and all teachers to use computers in every grade, and that eliminate even the possibility of alternatives." At the same time, the Alliance suggests, high-tech childhood is making children sick by promoting a sedentary life when childhood obesity is epidemic.

Today's children will inherit social and ecological crises involving tough moral choices and awesome technological power, the AFC warns. Problems like proliferation of devastating weapons and global warming will take all the "wisdom, compassion, courage, and creative energy" they can muster, it adds. Blind faith in technology will not suffice.

"A new approach to technology literacy, calibrated for the twenty-first century, requires us to help children develop the habits of mind, heart, and action that can, over time, mature into the adult capacities for moral reflection, ethical restraint, and compassionate service," the alliance says. It redefines technology literacy as "the mature capacity to participate creatively, critically, and responsibly in making technological choices that serve democracy, ecological sustainability, and a just society."

AFC’s reforms for education and family life seek to free children from what they call passive screen-based entertainment and teach technological heritage rooted in the study and practice of technology "as social ethics in action" and in renewed respect for nature.

Their reforms are:

- Make human relationships and commitment to strong communities a top home-school priority;
- color childhood green (their phrase, not mine) to refocus education on children's relationships with the rest of the living world;
- foster creativity every day, with time for arts and play;
- put community-based research and action at the heart of the science-technology curriculum;
- set one day a week as free of "electronic entertainment";
- end marketing aimed at children;
- shift spending from unproven high-tech classroom products to children's unmet basic needs.

According to the AFC, "To insist that [all teachers] spend huge amounts of money and time trying to integrate unproven classroom technologies into their teaching, across the curriculum with preschoolers on

up, is an unwise and costly diversion at the expense of our neediest children and schools."

An AFC report entitled "Tech Tonic – Towards a New Literacy of Technology" has 10 guiding principles for this new technology literacy and offers examples of each. It also includes suggestions for educators, parents, and other citizens to develop their own technology literacy, with a similar emphasis on social ethics in action.

The 10 principles for a new and more socially conscious technology literacy are:

1. Slow down: Honor the developmental needs of children.
2. With adolescents, teach technology as social ethics in action, with technical skills in a supporting role.
3. Relationships with the real world come first.
4. Technology is not destiny; its design and use flow from human choices.
5. Choice implies limits—and the option to say "no."
6. Those affected by technological choices deserve a voice in making them.
7. Use tools and technologies with mindfulness.
8. To teach technology literacy, become technologically literate.
9. Honor the precautionary principle. When uncertain, err on the side of caution: ask tough questions about long-term consequences. Make time, space, and silence for reflection. Remember that responsibility grows from humility. Be resourceful with the tools you already have.
10. Respect the sacredness of life in all its diversity.

The Alliance for Childhood issued a statement on September 12, 2000 called "Children and Computers: A Call for Action" (NB: The AFC have issued quite a few statements and calls for action over the years)

In this statement they assert that "Computers are reshaping children's lives, at home and at school, in profound and unexpected ways. Common sense suggests that we consider the potential harm, as well as the promised benefits, of this change."

They go on to explain that "Computers pose serious health hazards to children. The risks include repetitive stress injuries, eyestrain, obesity, social isolation, and, for some, long-term damage to physical, emotional, or intellectual development. Our children they claim, are the most sedentary generation ever.

Children need stronger personal bonds with caring adults, yet powerful technologies they claim are distracting children and adults from each other.

The alliance stresses that children need time for active, physical play; hands-on lessons of all kinds, especially in the arts; yet many schools they claim, have cut already minimal offerings in these areas to shift time and money to expensive, unproven technology.

They declare that sheer power of information technologies may actually hamper young children's intellectual growth; that computers pose health hazards and potentially serious developmental problems. Of particular concern for them is the growing incidence of disabling repetitive stress injuries among college students who began using computers in childhood.

The computer, they emphasize -- like the TV -- can be a mesmerizing babysitter. But many children, overwhelmed by the volume of data and flashy special effects of the World Wide Web and much software, have trouble focusing on any one task.

Too often, they claim, what computers actually connect children to are trivial games, inappropriate adult material, and aggressive advertising. They can also isolate children, emotionally and physically, from direct experience of the natural world.

Given the high costs and clear hazards, the alliance calls for a moratorium on the further introduction of computers in early childhood and elementary education, they call for:

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 the emphasis on computers affects 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.

This call for action is then "signed" by more than 80 people, mostly educators, health care professionals, researchers, and other childhood advocates.

The core beliefs of the Alliance for Childhood are hard to argue with, even if their statements are not. In much of their publications I can hear echoes of some of the stranger commentators I'll be introducing you to later in this seminar, like Todd Oppenheimer and Clifford Stoll, but there are also more thoughtful viewpoints which are harder to dismiss.

So what do you think of the Alliance for Childhood? Are you ready to join up? Ironically you can do this online. They're a growing movement and are not without influence in the USA, UK and other parts of Europe. They are active politically, they work hard for media coverage and gather parent support.

OK on to our first individual... very likely the most oft quoted person when it comes to presenting an argument against the use of IT in education... Larry Cuban.

Larry Cuban

"...schools have intractable working conditions, external groups make constant demands upon teachers, and the technology is inherently unreliable. Combined together, these reasons offer a seldom-heard explanation that would account for much teacher use of computers at home, less in classrooms, and the maintaining of customary teaching practices."

A person widely recognised as one of the leading commentators in this area is Larry Cuban. A teacher, professor, author and presenter, Cuban has long argued that schools and educators should be far more critical of the claims made about IT and the benefits this technology is supposed to provide to students.

Unlike some of his cohort, Cuban doesn't dismiss the value of IT outright. When asked in an interview conducted by Judy Salpeter, Editor, Technology & Learning, why he questioned the value of using IT in education, Cuban replied that there was "a lot of anecdotal evidence but no body of serious research to measure whether technology will achieve its own goals - whether it can help in areas such as intellectual development. I'm open minded. " He says "we might find that it works. In fact my hunch is that it probably does, but we don't know for sure. I remain a skeptic because so many claims have been made without questioning."

This lack of empirical evidence and the failure of educators to question IT's perceived educational value is one of Cuban's key criticisms.

Cuban attacks those who try to push the pace of IT integration calling them techno-reformers. At the same time he defends teachers who may not be fully embracing this reform of their classrooms and/or teaching methodology by IT. In an article he wrote for Education Weekly called Techno-Reformers and Classroom Teachers, Cuban takes a swipe at those who bemoan the lack of reform in schools saying that "...this persistent dream of technology driving school and classroom changes has continually foundered in transforming teaching practices. Although teachers have slowly added a few technologies to their repertoires, techno-reformers have seldom been pleased with either the pace of classroom change or the ways that teachers have used new machines."

The reasons for this failure of IT to transform teaching and learning is clear for Cuban. In another article, for edtechnot.com called So Much High-Tech Money Invested, So Little Use: How Come? he states "The facts are clear. Two decades after the introduction of personal computers in the nation, with more and more schools being wired, and billions of dollars being spent, less than two of every ten teachers are serious users of computers in their classrooms"

Cuban suggests that techno-reformers blame the teachers for this limited use in classrooms. "Their lack of preparation in universities, their lack of training, insufficient time to learn, too many older teachers, technophobia, etc., etc. "

Whilst Cuban accepts that this reasoning may "have some merit in explaining this phenomenon of infrequent and low-level uses of computers as accessibility has increased" he says it is too simplistic and ignores a few facts that have emerged from his research. He then goes on the list his "Facts" (I'm generally skeptical of researchers who use the word fact when they present what appears to be their own opinions, but anyway Cuban assures us these are facts and reminds us by typing the word fact in capital letters before each of these statements)

"FACT: Almost eight out of ten public school teachers have computers at home and use the machines to prepare lessons, communicate with colleagues and friends, search the Internet, and conduct personal business.

FACT: Most teachers use computers at home far more than at school.

FACT: Both at home and at school, older as well as younger teachers are serious and occasional users.

FACT: Most teachers believe that computers in school improve both teaching and learning.

CONCLUSION: There are few technophobes among the majority of public school teachers who use computers at home and school."

The question for Cuban is "with so much money invested in wiring schools, buying hardware, and constantly upgrading software across the country in the hope of transforming teaching and learning why are the majority of public school teachers serious home-users but at school infrequent classroom users? Furthermore, when teachers do use technologies in their classrooms, why does their use tend to sustain rather than alter existing teaching practices?"

To answer these questions and broaden the debate beyond those who push for IT and those with vested interests such as hardware and/or software manufacturers and retailers who he calls "cheerleaders for technology in schools", Cuban presents a strong defence of teachers by stating that " schools have intractable working conditions, external groups make constant demands upon teachers, and the technology is inherently unreliable. Combined together, these reasons offer a seldom-heard explanation that would account for much teacher use of computers at home, less in classrooms, and the maintaining of customary teaching practices."

Does it have a ring of truth about it? That's the problem with Larry Cuban, he's not so easy to dismiss, and once you don't dismiss him, you might start to question what we are doing with IT.

Right then... on to our next dissident. This gentlemen has managed to polarize opinion of himself... to some he is an enlightened free thinker and to others he is a plain old crank... Mr Todd Oppenheimer

Todd Oppenheimer

"There is no good evidence that most uses of computers significantly improve teaching and learning, yet school districts are cutting programs -- music, art, physical education -- that enrich children's lives to make room for this dubious nostrum"

Todd Oppenheimer is not a Luddite. That, it is important for me to mention a statement like that in a discussion of educational technology speaks to the pervasiveness of technology and the strength of our collective faith in its transforming potential. It is an important statement though because Oppenheimer has produced a series of indictments of the efforts to put computers and technology in classrooms. Seeing him as just a reflexive opponent of technology would make it too easy to dismiss his observations out of hand.

Oppenheimer argues that there is no good evidence that most uses of computers significantly improve teaching and learning, yet school districts are cutting programs—music, art, physical education—that enrich children's lives to make room for what he calls "this dubious nostrum". Oppenheimer implores teachers and parents to think through the matter of computers in the classroom clearly before rushing to embrace them at such great cost.

Rather than an educationalist, Oppenheimer's background has been in writing, as a freelance journalist and more lately as an author. He stepped into the IT debate in big way in 1997 with his controversial article "The Computer Delusion," in Atlantic Monthly. This article sparked a wide ranging debate and has created a subsection of comment devoted to criticizing and reviewing Oppenheimer himself.

Oppenheimer has recently expanded this original article into a book called *The Flickering Mind: The False Promise of Technology in the Classroom, and How Learning Can Be Saved* which has been met with predictable reviews, with the usual divisions along the lines of support; those who favour the use of IT in schools and those who oppose it.

According to Oppenheimer, education is facing an unusual moment of crisis. For decades, he says, teachers and schools have been under threat from "a series of curriculum fads, empty crusades for reform, and stingy funding". The "miracle of computers and the internet" is offering the biggest and therefore the most expensive promise ever to schools. He argues that IT is transforming the whole educational world. He blames the integration of IT for a reduction in the ability of students "to reason, to listen, to feel empathy".

Like Cuban, Oppenheimer compares the current enthusiasm for IT with the ultimately misguided excitement that was seen for other emergent technologies, such as film, radio and television. "In 1922 Thomas Edison predicted that "the motion picture is destined to revolutionize our educational system and ... in a few years it will supplant largely, if not entirely, the use of textbooks." Twenty-three years later, in 1945, William Levenson, the director of the Cleveland public schools' radio station, claimed that "the time may come when a portable radio receiver will be as common in the classroom as is the blackboard." Forty years after that the noted psychologist B. F. Skinner, referring to the first days of his "teaching machines," in the late 1950s and early 1960s, wrote, "I was soon saying that, with the help of teaching machines and programmed instruction, students could learn twice as much in the same time and with the same effort as in a standard classroom."

If history really is repeating itself, according to Oppenheimer, then education is in serious trouble.

Oppenheimer discredits much of the research which extols the virtues of IT as unsubstantiated or flawed by the vested interests of those conducting it or sponsoring it.

One of his biggest concerns is the financial effects of IT in education. For Oppenheimer, the costs of technology for schools is beyond the means of most school administrators or business managers. The consequence of this for schools is the significant reduction of available funds in almost all other areas of the curriculum. "...as spending on technology increases, school book purchases are stagnant. Shop classes,

with their tradition of teaching children building skills with wood and metal, have been almost entirely replaced by new technology education programs."

The main issue, Oppenheimer suggests, is the magnitude of the errors. He speaks about Alan Lesgold, a professor of psychology and the associate director of the Learning Research and Development Center at the University of Pittsburgh, who calls the computer an "amplifier," because it encourages both enlightened study practices and thoughtless ones. He states that "there's a real risk, though, that the thoughtless practices will dominate, slowly dumbing down huge numbers of tomorrow's adults".

Oppenheimer quotes Sherry Turkle, a professor of the sociology of science at the Massachusetts Institute of Technology and a longtime observer of children's use of computers, "The possibilities of using this thing poorly so outweigh the chance of using it well, it makes people like us, who are fundamentally optimistic about computers, very reticent." (Actually lots of people who oppose IT in schools like to quote Sherry Turkle, however I'm not convinced that Dr. Turkle is actually supportive of their position. OK she doesn't like some of the past and current uses of IT by schools and she criticizes a lot of the software that gets used in schools – she's particularly savage on PowerPoint – good for her I say - but I haven't found anything in her writing that calls for computers to be removed from classrooms – I guess it shows how selective and misleading quotes can be.)

In 2004 two researchers Thomas Fuchs & Ludger Woessmann, published a much quoted report entitled "Computers and Student Learning: Bivariate and Multivariate Evidence on the Availability and Use of Computers at Home and at School" (catchy title eh?)

For schools and parents who have together invested billions of dollars to give children a learning edge through the latest computer technology, this study brought some sobering news: Too much exposure to computers might spell trouble for the developing mind.

From a sample of 175,000 15-year-old students in 31 countries, the researchers at the University of Munich announced that performance in maths and reading had suffered significantly among students who have more than one computer at home. And while students seemed to benefit from limited use of computers at school, those who used them several times per week at school saw their academic performance decline significantly as well.

Woessmann said in an interview that "It seems if you overuse computers and trade them for other [types of] teaching, it actually harms the student... At least we should be cautious in stating that increasing [access to] computers in the home and school will improve students' math and reading performance."

With the rise of computers in classrooms, has come a glut of conflicting conclusions about the actual value computers bring to timeless tasks of teaching reading, writing, and arithmetic.

Fuchs & Woessmann's results indicated how thoroughly this field of research has come to resemble that of the conventional wisdom about weight loss, which seems to shift with the tide... high protein, low carb? or low protein and high carb?

For those who oppose the spread of IT in schools the results of this study were a hopeful sign of a maturing debate, where blind faith in the educational benefits of technology is giving way to greater appreciation for an understanding when computers are useful and when they're not.

Computer technology "is used too much and very unwisely in the younger years, and not wisely enough in the older years," says Oppenheimer. For 15-year-olds, he says, "you'd be foolish not to use the [World Wide] Web" for a research project, but only alongside conventional information-gathering techniques. The big picture goal: help students use high-quality sources.

Against this backdrop, Oppenheimer says that the German study stands out on account of two features: its unusually broad, international sample and its bid to isolate computers as a performance-shaping factor.

According to Oppenheimer this study tells us that "The mere availability of computers at home seems to distract students from learning." Computers seem to serve mainly as devices for playing games.

Oppenheimer is largely dismissed by educators and academics, perhaps because his is neither. His arguments are seen as superficial and inconsequential. However his ability to self-promote, create headlines and polarize opinion makes him an interesting character in this study.

Clifford Stoll

"Whenever I point out the dubious value of computers in schools, I hear, 'Look, computers are everywhere, so we have to bring them into the classroom.' Well, automobiles are everywhere, too. They play a damned important part in our society, and it's hard to get a job if you can't drive. In fact, cars count for more of our economy than do computers. But we don't teach automotive literacy."

Clifford Stoll is our next IT dissident, and he is an interesting fellow indeed. Stoll first came to prominence in 1989 with the publication of his book, *The Cuckoo's Egg*, an amazing account of his search across the Internet to catch a German cracker who was breaking into military computers all over the world.

Mr. Stoll is an astronomer by trade, who was "promoted" to Systems Manager at his lab. While examining the accounting records, he noticed a 75-cent error in the billing logs. He began investigating the logs to rectify the error, and discovered enough discrepancies to make him believe someone was tapping into their system illegally. Before the search was done, the CIA, the FBI, and the NSA were involved but Mr. Stoll was the one who finally tracked him down.

The perpetrator was a twenty-five year old German hacker named Markus Hess who was selling US government secrets to the KGB for money and cocaine.

His second book, *Silicon Snake Oil*, brought him more fame and fortune, but often brought criticism from those who didn't like his critical view of Internet culture. Mr. Stoll's idea is that some aspects of the World Wide Web may strip us of some of our humanity...if we let it.

I've never met Mr Stoll but from what I've read he might be interesting dinner company were I to have the opportunity, if only because of his eccentricities. Some notable Stoll quotes on IT include:

On IT he says

- I love computers and I use them all the time. I've got a half-dozen computers in my house. But this cult of computing gives me the heebie-jeebies, the sense that if you don't have an electronic-mail address, if you don't have your own customized homepage on the World Wide Web, if you don't have your own domain name online, then you're being left behind, that progress is going on without you.
- Human kindness, warmth, interaction, friendship, and family are far more important than anything that can come across my cathode-ray tube. While I admire the insights of many of the people in the world of computing, I get this cold feeling that I speak a different language.

On Education he says

- Most learning isn't fun. Learning takes work. Discipline. Commitment, from both teacher and student. Responsibility.
- Many subjects aren't fun. I wonder how the fun-to-learn teacher handles the Holocaust, Rape of Nanking, or American slavery... Show me the computer program that encourages quiet reflection.

On the Internet he says

- The Internet is just a telephone system that's gotten uppity.
- With a computer, you're interacting with something, not someone.

On computers and their owners he says

- Why is it drug addicts and computer aficionados are both called users?
- Minds think with ideas, not information. No amount of data, bandwidth, or processing power can substitute for inspired thought.
- One of the great joys of computers is how they're great at wasting time that would otherwise be difficult to waste.

Clifford Stoll clearly loves computers. He loves them so much apparently he converted his old outdated Macintosh into an aquarium rather than put it out with the trash. (I don't know if this story is actually true, but it comes up in almost every reference to Stoll. Still, if it's on the web it must be true, right?) What this veteran programmer and self-made social critic doesn't love, however, is according to him "the cult of computing"--the "blind faith that technology will deliver a cornucopia of futuristic goodies without extracting payment in kind."

In particular, Stoll hates the way computer cultists have infiltrated schools, and in his book *High Tech Heretic: Why Computers Don't Belong in the Classroom and Other Reflections by a Computer Contrarian* he aims every argument in his arsenal at the widespread belief that computers are the greatest educational invention since chalk. While he's at it, he also takes some potshots at the hype about virtual community, the Internet economy, and the death of the book, as well as the scourges of buggy software, ugly hardware, and PowerPoint. (Actually I didn't mind him attacking PowerPoint, I've got a personal dislike of it myself and no, my slideshow was not made with PowerPoint)

Stoll takes a critical view of IT in education, focusing on the increasingly widespread use of computers in nurseries, preschools, classrooms and libraries. Throwing down the gauntlet in his introduction, he states, "I believe that a good school needs no computers. And a bad school won't be much improved by even the fastest Internet links. That a good teacher can handle her subject without any multimedia support.... That students, justifiably, recognize computer assignments primarily as entertainment, rather than education." In the first half of the book, he explains and justifies these beliefs: computers are expensive, quickly become obsolete and require maintenance by an expensive technical staff, usually paid for by eliminating other services (e.g., money for Internet connectivity sometimes comes from library budgets). He contends that computers and calculators work against familiarity with numbers, learning basic arithmetic and an understanding of algebra.

Stoll is a very smart guy who brings his skeptical intelligence to bear on some critical questions. This is a man who cares passionately about learning and its transmission, and he can't figure out how diverting students with computer exercises fosters understanding. He cites horrifying instances of schools shortchanging true pedagogy for machinery they're not properly equipped to use, and demolishes the arguments one by one for computers in schools.

To the idea that students will graduate into a world of ubiquitous computing, he says, "Automobiles are everywhere, too. They play a damned important part in our society and it's hard to get a job if you can't drive. ... But we don't teach automobile literacy." To the notion that networked computers can keep curricula current, he scoffs, "The past two decades of research haven't greatly changed basic high-school math, physics and chemistry."

To the suggestion that computers make learning fun, he answers that real learning is unavoidably hard, and that computers merely substitute games. His arguments are almost convincing. "Computer literacy" is an empty cliché that, for most people, means knowing how to type, backspace and click a mouse. In fact, Stoll doesn't think schools need much in the way of technology, aside from indoor plumbing and good light. He sees "distance learning" as a joke, and loathes the tendency of today's students to rely on calculators. He heaps scorn, too, on the idea that computers can somehow replace books in libraries. Stoll is convinced the Internet isolates us (in part by enfolding us in useless data while real life is going on outside), rather than bringing us together.

Clifford Stoll has something to say on most things, especially when it's IT related, for example on computer literacy he has said:

"I don't think our society suffers from a fear of technology. If anything, our problems are rooted in a love affair with gizmos."

"Sure, kids love computers. I met an eighth grader who told me he'd spent his summer vacation logged onto the Internet for seven hours a day. Every day of the summer. A thirteen-year-old girl looked at me with a fresh face and asked, 'How can I meet boys if I'm not on-line?'"

On computers in the classroom Stoll asks

"So how long does it take to learn word processing? A day? Maybe three? Of course, using a computer requires learning to type. Oops, I mean acquiring keyboarding proficiency. Still, this is hardly rocket science."

On computers, the Internet and the information age Stoll states

"For years, we've been bludgeoned with the cliché 'information is power.' But information isn't power. After all, who's got the most information in your neighborhood? Librarians. And they're famous for having no power at all. And who has the most power in your community? Politicians. And they're notorious for being ill-informed."

Stoll is obviously a clever man with a strong science and computing background. This lends him some credence when he speaks about IT, I'm not so sure however that many people are convinced about his credentials when it comes to rendering opinions on education.

Which brings us to our last dissident, and my personal favourite, if only because his views are so extreme and yet there's an undeniable logic to them... well sort of if you can get past the inherent nuttiness .. Mr Chet Bowers

Chet Bowers

“The failure of the computer proponents is in not asking more probing questions about the forms of knowledge that computers cannot process and in not examining the deep cultural assumptions that give their thinking such an ethnocentric and formulaic quality. At deeper fault is our educational system, which fails to provide computer proponents and their followers with an understanding of the complex relationship between culture and technology”

Chet Bowers is a professor (now retired) at Portland State University in Oregon, and formerly was a Professor in the College of Education at the University of Oregon. He has long been a critic of IT in education and is author of a number of books on the topic including *Let Them Eat Data: How Computers Affect Education, Cultural Diversity, and the Prospects of Ecological Sustainability* (another very catchy title)

Whilst other opponents of IT in education busy themselves with issues like the spiraling costs of acquiring and maintaining equipment, the potential health hazard posed by the equipment or the likelihood that students will be distracted from their real study by the tech wizardry, Chet Bowers draws a much longer bow... he draws a very long bow indeed.

Bowers' main thesis is that computer use reinforces the attitudes of the Western Industrial Revolution, and that this, in turn, leads to environmental corruption. His stance is pessimistic, and he seems to find little hope that using computers as educational tools will yield anything but negative consequences.

Bowers attempts to explore that dark side and reveal the grim consequences of computerization. He does not concern himself with common criticisms: that under-funded schools have difficulty accessing computers and are therefore put at a greater disadvantage, that students do not regard downloaded information critically, etc. Instead, Bowers' critique concerns cultural ways of knowing and the environmental crisis.

For him computers are not neutral communication devices -- they are culturally transformative and encode Western ideology onto all who use them. The spread of computers marks the proliferation of that ideology; endangering non-Western cultural beliefs and practices. Furthermore, Bowers contends that there is a causal link between the proliferation of Western beliefs and the global environmental crisis.

According to Bowers these problems include: exploding overpopulation, exhaustion of agricultural land and fisheries, global warming, hazardous waste, and harm caused by synthetic chemicals. These environmental problems, Bowers argues, will be the major headache of the 21st century. He details the general complicity of the computer in worsening environmental problems. (That seems to be an awful lot of blame to lay on a little plastic box filled with silicon chips and circuitry but for Bowers computers can't and won't solve the world's environmental problems because they are the cause of them.)

For Bowers, the attitudes that are reinforced by computer technology are those of Western industrial culture, and as such are attitudes that have grave implications for the environment. He comes back to this position time and again in his writing. IT is basically a delivery system for Western ideology. Just as language is not a neutral conduit of thought, neither are computers, Bowers argues. They are a powerful force that reflects and reinforces a culture's beliefs and practices. Simply by using computers for communication, for example, users implicitly consent to the Western ideal of individualism over the face-to-face interaction characteristic of many non-Western cultures. Bowers refers to the present as the "digital phase of the industrial revolution". To the extent that computer use is being spread globally -- particularly among the so-called "third world" -- computers serve to propagate typically Western beliefs and practices. Among these are:

- * the myth of progress--the belief that progress is linear, and that all change is good
- * the celebration of the autonomous individual
- * the valuing of commodified relationships and knowledge
- * the preference of decontextualized data over generational wisdom
- * the promotion of consumerism

- * the decline of valuable face-to-face interaction; especially mentoring relationships
- * human-nature relationship dominated by anthropocentrism

The global expansion of Western ideology means the gradual decline of local cultural beliefs and practices, he argues.

Bowers pays particular attention to how Western culture's individualism has structured technology and how technology, in turn, reinforces a sentiment of individualism:

“With the exception of the near-total immersion of virtual reality, the experience of self-other relationships in cyberspace amplifies the culture of autonomous individualism in various ways. The words, graphics, and images of the screen represent decontextualized forms of text that require individual interpretation and analysis.”

Bowers complains that the discussion of computers in schools on all levels has been too narrow, and he specifically cites the lack of discussion about cultural and environmental issues. Of particular interest to educators should be Bowers's attack on constructivism in education (a constructivist approach is said by many to be enhanced by computer technology). Constructivism, which Bowers understands to be the view that “students learn by actively constructing rather than acquiring knowledge,” is both misleading and harmful. It is misleading for Bowers because it ignores the fact that, if children learn any sort of symbolic medium, like language, they are being socialized into that culture's world-view. Thus, by participating in a culture's symbolic heritage, the student is not really constructing knowledge but instead is being sculpted from the outside. Furthermore, constructivism is harmful because, “The emphasis on the child as constructor of knowledge appears to support liberal assumptions about freedom, progress, individualism, and an anthropocentric world”. For Bowers, these views marginalize cultural ways of knowing. These are controversial claims, indeed, and whether Bowers is ultimately right or wrong (or right *and* wrong), he has done the educational community a service by asking new questions about a popular educational idea.

Bowers has seven important points for educators. These seven points sum up his major arguments. He argues:

- (1) that we should be aware of the differences between Western technologies and more ecologically sound cultures,
- (2) that we should be aware of alternative approaches to technology when making democratic decisions involving technology,
- (3) that further study is needed on how modern technology changes culture and commodifies relationships,
- (4) that a more complex view of culture is needed than what is currently presupposed by modern technology enthusiasts,
- (5) that technology affects language and thought patterns,
- (6) that issues of justice arise when technology and the nature of work intersect, and
- (7) that we should understand how the computer carries cultural assumptions that threaten diversity and sustainability.

Interesting stuff... Bowers certainly takes this discussion to a whole new level. For him the concerns of computer expense or distraction from study are mere trivialities, the bigger and more insidious picture is how IT is leading to globalization and the destruction of cultural diversity in non-Western societies. Given that Bowers draws a direct line between the ecological and climate problems that may bedevil the world at this time and the Western industrial culture, he therefore sees IT as being the main transfer method for this destructive culture.

I don't claim to accept Bowers logic on the ultimately destructive influence of Western culture, nor do I agree with what Bowers claims about IT in education but I love the fact that he sees it as such a root of evil in the world, blaming it for all kinds of mayhem, from globalization and the decrease in cultural diversity to ecological damage and the destruction of the environment – consider that next time you bring your grade one class to the computer lab to use KidPix.

So, should we pause and reflect on what we are doing with IT in schools? Should we try to rewind the clock? Or are those who express concerns, ask questions or call for a halt really just holding us back from even greater developments in education through the use of IT?

In my own professional experience I have been involved in IT in education for nearly 20 years, in four quite different schools.

I have taught subjects involving the use of computers to a greater or lesser extent and called a variety of different names:

Computer Studies,

Information Technology,

Technology,

Design Technology,

Multimedia,

Computer Applications,

Information Processing and Management,

Information Systems,

Information and Communication Technology,

Information Technology in a Global Society

I have been required to set up and administer computer labs - Mac's in one school and PC's in three others. I have established and managed a student laptop computer program of 250 plus computers. I once convinced a school business manager to purchase faculty laptop computers, one for each member of the faculty - more than 100 computers - the faculty members paid nothing and could keep them as long as they remained employed at the school (I still can't believe I pulled that one off).

I have chaired or been a member of way too many technology committees.

In addition to all this, I have been what I can only describe as an evangelist for the use computers in schools. I have run in-service training for staff. I have provided after school instruction for students and parents.

I have spent many hundreds of thousands of dollars (maybe into the millions by now) of school money on IT.

In all of this I can recall only a few isolated instances when I have had anything like a serious discussion on the educational philosophy underpinning any decision to buy more equipment. Not because I didn't want to, but because principals, heads of schools, administrators either didn't have the time, hadn't thought about it themselves or simply weren't interested.

I fully expect that anyone of you who has been involved in this subject area in schools for any length of time will be able to tell a similar story.

I am no great fan of Larry Cuban (and I have serious concerns about much that Messer's Oppenheimer, Stoll and Bowers have to say) but Cuban raises three questions that both interest and trouble me. They are questions he says should be asked before a school embarks on spending money and time on any IT:

1. What do you want students and teachers to achieve?
2. Can you reach the same educational goals without the expenditure on IT?
3. If you do need to buy IT, what configuration of technology would best meet your goals?

I wish I could have had some of my principals and tech committee members provide some serious replies to these questions before we embarked on some of our spending sprees.

Having said all this, the school I am in currently has recently received a grant from the local government for IT purchases. I was informed a little while back that we were buying another set of notebook computers on trolleys to be pushed into classrooms and workstations for the Art rooms complete with PC's, printers and scanners. When I asked why we were buying this, I got a quizzical look from our director of technology who replied "oh, ...well we got the funding..."

Thank you for listening, I hope you have found something worthwhile in this seminar. Perhaps it might prompt you to do some further study of these digital heretics. In an ironic twist, a great deal of information about them is available on the Internet, I wonder how happy Chet Bowers is about that.