"It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, it was the season of Light, it was the season of Darkness, it was the spring of hope, it was the winter of despair, we had everything before us, we had nothing before us…"

How many of you can remember the beginning of "A Tale of Two Cities?" written about the year 1775—230 years ago!

That is an apt description for our own tale of technology in schools today.

None of us started technology savvy—it wasn't a discipline as it is now. The program I oversee at Lesley University claims to have been the first at the higher education level in the country.

Some of you may have taught or been taught this novel. I am always surprised but gratified to see how many people interested in technology in schools today were originally English teachers.

We live in challenging times. Just when the technology that we have been promised is available for the masses, schools do not have the money to buy the technology, maintain it and support its use. The President announced his budget recently and it proposes cutting all funding for educational technology, the money that came into the Commonwealth and then went to you as both entitlement and competitive grants. Many of us wrote letters to Secretary Spellings, Senators Kennedy and Kerry and the ten Representatives from Massachusetts (Frank, Meehan, Markey, Delahunt etc.) I myself received an official reply in a brown wrapper from the US Department of Education –marked Official Business.

Let me read you a couple of pertinent paragraphs…Some folks in Washington do not get it…Standing still is falling back. Actually the President's people sound

just like some members of the communities I have worked with….."We have already invested," they say, "it is enough!!!"

I then wrote to the President and told him what Secretary Spellings had told me and how much I disagreed with her. I haven't heard back!

But even if we could afford all the technology in the world, we still need to know how to plan for its failure –isn't it everyone's experience that when you want to show off some wonderful presentation or proposal, the machinery fails??? And/or it is not available when you need it? If you only have a few projectors, it is possible there won't be one for you to use when you need it.

And then there are those families who can afford all the latest technology and therefore are more advanced than their schools… (I was at the Apple store in Chestnut Hill on a recent Saturday and the line to purchase stretched almost the full length of the store)

And there are those families who cannot afford it so the schools are more advanced than they. Sometimes there is justice. Boston has a program called Technology Goes Home@School. Parents and students learn how to use computers and then can have one at home at no cost.

One of the observations many people have made is that in MA, as across the country, the discrepancies among schools and among students are pretty startling.

It certainly makes us rethink…

---Do we have graduation outcomes which are reasonable for everyone?

---Are pre-service teachers being well prepared to use technology as a teaching tool?

----Do we know how to do contingency planning? (Can we figure out workarounds when the technology is not cooperative?)

----Are we keeping our eyes on the future so that we can incorporate into T & L the appropriate possibilities from the emerging and anticipated technologies?

I remember when MCET offered schools a satellite dish for distance learning for about $1000. We could offer low incidence disciplinary programming (science and foreign languages were high on the list) and special features such as experts presenting their expertise. In Easton we chose to take advantage of the opportunity, only to find that sometimes the program was not scheduled when we could use it; sometimes the reception failed and sometimes it was not as appropriate as we believed from the description. Teachers and students became frustrated to have wasted precious time to come to the high school library and be disappointed. So we created a classroom in the library where the class could stay and have its session without the satellite lesson. We also taped the transmissions so we could use them at the appropriate class time. That is an example of contingency planning…it is also an example of a technology that had its moment in the sun in schools because it could not achieve the interactive goal it had set…only one person could call and participate at a time. So we learned from that 1990 experience which we now use in our current thinking about distance learning.

One very important area where change has occurred is in the area of research. In the beginning, we only had our own faith and anecdotal evidence to support our contentions about the efficacy of the use of technology in the schools. Apple with its ACOT program offered support, but many community members felt it was self-serving evidence since Apple paid an outside company to do the work…today the reaction might be different. The line between provider and user has diminished.

Now there is a growing body of good research to support the beliefs that many of us share:

In addition it has become clear that the 21st century economy requires students who have 21st century skills and those definitely include technology skills.

These studies are being done by:

Associations
States in conjunction with other agencies (Maine and U of Maine)
Universities
Individuals
Think tanks

In late August, 2000, the SIIA (The Software & Information Industry Association)[1], the principal trade association of the software code and information content industries, released a report on Effectiveness of Education Technology. The 135-page report highlighting the results of more than 300 recent surveys on education technology from professional journals, doctoral dissertations and other qualified sources.

The report clearly states that education technology

- increases student achievement,
- enhances student self-concept and attitude about learning, and
- improves interaction involving educators and students in the learning environment.

The report shows that students are more successful in school, are more motivated to learn, and have increased self-confidence and self-esteem when technology is present in the educational environment. This is especially true for students with special needs.

[1] SIIA represents more than 1,000 leading high-tech companies that develop And market software and electronic content for business, education, consumers and the Internet. For further information, visit <http://www.siia.net.

Technology is also a catalyst for successful collaborative learning and teamwork in small groups, and helps students who seldom participate in class discussions become more involved.

"Technology improves teaching and learning, but the simple addition of computers in schools does not directly translate to higher test scores and never will. From the school board and district administrators to principals and teachers, setting the right condition and thorough training are the two most important keys to success. In this sense, the process of technology integration into the curriculum is just as important as the technology itself."

Variables that influence the effectiveness of education technology, identified in the report, include attributes of the student population, software design, the educator's role, student grouping, educator training and the level of student access to the technology. The leading variable is
educator training, as students of teachers with more than ten hours of training significantly out-performed students of teachers with five or fewer training hours.

That is a view from a bridge similar to ACOT, one might say.

But there are other research-based results from other studies.

Margaret Honey of EDC in "New Approaches to Assessing Students' Technology-Based Work" in Great Expectations: Leveraging America's Investment in Educational Technology, 2002

"After more than two decades of research on the benefits of educational technology, evidence that demonstrates the positive effects technology can have on student achievement is mounting. Specifically studies have shown that:

- Large-scale statewide technology implementations have correlated use of technology with increases in students' performance on standardized tests.
-
- Software supporting the acquisition of early literacy skills - including phonemic awareness, vocabulary development, reading comprehension and spelling - can support student learning gains.
-
- Mathematics software, particularly programs that promote experimentation and problem solving, enable students to embrace key mathematical concepts that are otherwise difficult to grasp.
-
- Scientific simulations, microcomputer-based laboratories and scientific visualization tools have all been shown to result in students' increased understanding of core science concepts.

"We have also learned that if technologies are to be used to support real gains in educational outcomes, then five factors must be in place and working in concert.

1. There must be leadership around technology use that is anchored in solid educational objectives. Simply placing technologies in schools does little good. Effective technology use is always targeted at specific educational objectives; whether for literacy or science learning, focus is the key to success.

2. There must be sustained and intensive professional development that takes place in the service of the core vision, not simply around technology for its own sake; moreover, this development must be a process that is embedded in the culture of schools.

3. There must be adequate technology resources in the schools, including hardware and technical support to keep things running smoothly.

4. There must be recognition that real change and lasting results take time.

5. Finally, evaluations must be conducted that enable school leaders and teachers both to determine whether they are realizing their goals and to help them adjust their practice to better meet those goals."

See
http://www2.edc.org/CCT/publications_report_summary.asp?numPubId=49

The states are getting into the research act:
In Missouri "Changing the Face of Education in Missouri in New Horizons, 2002 stated:

"Currently there are 585 eMINTS (enhancing Missouri's Instructional Networked Teaching Strategies) classrooms in grades 3-12 in rural, suburban and urban settings throughout Missouri. Over 15,000 children and teachers report to eMINTS classrooms every morning. When they reach those classrooms they find a rich array of multimedia learning technologies, including:

- Teacher laptop
- Interactive whiteboard and projector
- Teacher workstation computer
- Digital camera and scanner
- Printers
- One Internet-connected computer for every two students
- Software limited to Microsoft Office and Inspiration"

"However, what these teachers and students DO with the technology is the big story. The instructional model promoted and supported by eMINTS is inquiry-based, collaborative and multi-disciplinary in nature. Teachers must often learn to teach in very different ways from those they learned and have practiced over the years. "

"The analysis of MAP (Missouri Assessment Program) scores for students in eMINTS classrooms in the spring of 2001 showed that, on average, students in eMINTS classes scored higher in every subject area than other students. The analysis compared 1,836 students enrolled in eMINTS classes with 4,217 students not enrolled in eMINTS classes in the same grades and schools. In every subject area, students enrolled in third and fourth grade eMINTS classes scored higher than students not enrolled in eMINTS classes. In addition, the average eMINTS student scored higher than the statewide student average in every subject area. "
See http://emints.more.net/evaluation/reports

The Universities also have a stake in this debate. One of the earliest studies was done by *Michael Russell, Professor at the Center for the Study of Testing, Evaluation, and Educational Policy at Boston College,*

"We just finished a meta-analysis of the effects of computers and student writing. This study focused on research performed since 1991 and found a positive effect of about .4 standard deviations on the quality of student writing and .5 standard deviations on the quantity of student writing. ...This effect tended to be larger for middle and high school students than for elementary students."
They continue to study the effectiveness of technology. See
http://www.intasc.org f

Robert Tinker, President of the Concord Consortium, has another interesting view:
"It is as silly to ask for "a study.. of education technology" as it would be to study whether cars are useful. The are many situations in which educational technology is inappropriate or badly implemented. Similarly, there are many situations where the value of technology is so obvious that no study is needed. And there have been a wealth of rigorous studies, not just anecdotes, that show the value of particular technologies in particular contexts. There have been many reviews of these studies, such as the 1999 research review by John Schacter, available at http://web.mff.org/publications/publications.taf?page=161 and the

Fall, 2000 issue of the "Future of Children" from the Packard Foundation at http://www.futureofchildren.org/pubs-info2825/pubs-info.htm?doc_id=6978 "

So while the necessity for technology has become clearer and more urgent, the funding and the willingness to support it in schools has taken a turn away at this moment…I recently had a chance to speak with a group of colleagues in a collaborative that my school districts belonged to about influence and advocacy and so many of them are depressed and feeling alone on the issue of technology. My operating principle is---you cannot stop advocating for what you believe in…Even the darkest hours do end in the light. There are many groups which care about this topic:

Chief among them is ETAC
The Pipeline Fund created CITI
The Collaborative such as EDCO and TEC do work together to support the use of technology
And then there is BEST
And ad hoc groups which come together such as TTEC inspired by the need to ensure that educator licenses have technology competency requirements.

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