

**TOWARD A BALANCED
APPRAISAL OF EDUCATIONAL
TECHNOLOGY IN U.S.
SCHOOLS AND A RECOGNITION
OF SEVEN LEADERSHIP
CHALLENGES**

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In 1942 Winston Churchill was asked if he believed the war was coming to an end. No, he replied, the war was not coming to an end. It was not even at the beginning of the end. Perhaps, he opined, it had come to the end of the beginning.¹ I believe the “end of the beginning” is a good way to characterize where we are presently in the story of the use of information and communications technology (ICT) in our schools. If we are at the “end of the beginning,” what has been accomplished so far and what are the challenges yet to be overcome?

Discussions of the status of educational technology in U.S. schools over the past couple of decades have too often had the character either of attempts to convince others that ICT has been successful or that it has failed. The counterpoint between cheerleaders and curmudgeons is of no value for those whose task is to find ways to make ICT improve our schools. Just as opponents of the use of ICT often overstate the case for the irrelevance, waste, or harm from the use of ICT in the schools, proponents often overstate the positive consequences that have accrued from the use of ICT in schools. Many of the highly dedicated and capable people who work with ICT in the schools know – often better than the critics – where we have fallen short in the effort to derive the full measure of benefit in the use of ICT for the betterment of the lives of our kids in school. It is up to those who realize what is possible in the use of ICT to be clear-eyed and frank in their assessment of current situation and uncompromising in the expression of what needs to be done to make the possible a reality.

Computers first entered schools about a quarter of a century ago in the form of the then new microcomputers. The Apple IIe was introduced in 1983 and the Commodore 64 was introduced in 1984. The decade of the 80s saw a dramatic influx of microcomputers into schools. Much was being said and written about the “computer revolution” in schools. Papers in education journals and reports in the popular media forecasted an impending transformation of America schools as a result of the proliferation of computers in schools. Yet, as the 80s wore on and reality replaced fantasy, some pundits were proclaiming the “revolution that never happened.”

In the 90s the emergence of the World Wide Web had profound impact on the expansion of interest in ICT in the schools. Schools began to move from “stand alone” microcomputers and installed LANs and to provide connections to the Internet. With the onset of networking the support issue was addressed to some extent since at least enough network support had to be provided to keep networks up and running. The extensive use of the Internet also provided some relief for the software problem since the World Wide Web contains rich content in abundance. The recognition of the importance of computer networking led to the founding of the Consortium for School Networking (CoSN) in 1992.

The Telecommunications Act of 1996 was a major reconstruction of U.S. telecommunications policy – the first in 62 years. The work on the re-write of the U.S. telecommunications law came at the time when there was strong and growing recognition of the potential of the Internet in the form of the World Wide Web. The concept of “universal service” or the guarantee of access to affordable telephone service for all Americans that had long been U.S. telecommunications policy was extended to include support for access of schools, libraries, and health care providers for access to advanced telecommunications services. Two and quarter billion dollars per year were authorized to provide subsidies to schools based on need. Over the life of the E-rate program, which began to award funds in 1998, approximately 7 billion dollars has been dispersed.¹ The increased use of networking caused ICT to become understood and implemented as a school-system-wide resource rather than as a resource isolated to individual teachers as it had largely been in the 80s.

Education Week provides a yearly report on technology in the schools called “Technology Counts”.³ Among the statistics in the 2002 study (which reported on data collected in 2001) are a few key stats (The numbers in parentheses show the figures for the same indicators for 1997):

- There is one instructional computer for every 4.2 students in U.S. schools. (13-1)
- Ninety-eight percent of U.S. schools are connected to the Internet. (58%)
- Eighty-six percent of all U.S. schools have Internet access from one or more classrooms (58%) and 72 percent of those schools connect via a T1, T3, digital satellite, or cable modem (No parallel 1997 were reported.)
- Eighty-five percent of U.S. 4th graders in U.S. were in schools where computer were available in classrooms. (No parallel 1997 were reported.)

Counting computers and connections might seem to be the easiest and most reliable data to collect pertaining to the impact of computers in the schools, but the data reported above need to be taken with caution since the data in *Technology Counts* are self reported and not subjected to audit. As I visit schools in my own state of Michigan – a state for which the statistics on computer infrastructure are generally at the national average, I find it quite common to encounter schools where the ratio of students to working computers is far less favorable than 1 to 4 and, I seldom encounter schools with a better ratio. Internet access for use for students remains problematic for many teachers who wish to make other than occasional use of it or who wish to use it for an entire class of students.

Nevertheless, there have been substantial increases in the amount of computers in the schools, and in the quantity and quality of connectivity to the Internet. It is premature to conclude, as I have heard some at the

national level conclude, that the infrastructure problem in schools is solved but, the investments in infrastructure development as a result of the E-Rate, as well as the other investments made by states and localities have resulted in a substantial expansion of the number of computers and Internet connectivity in schools.

The early years of computers in schools were much about, just that – getting computers into schools. There were many instances of providing computers without accompanying training teachers on how to use them and even without furnishing software for the machines. Technology savvy teachers who would help out their colleagues when they could steal a few minutes from their own classroom responsibilities provided technical support forth their fellow teachers with computer problems.

There is increasing realization that putting hardware into schools constitutes only one element in the establishment of an infrastructure for the effective use of ICT in schools. The CoSN Total Cost of Ownership (TCO) ⁴ initiative that began in 1999 has contributed to an increasing level of sophistication about the real costs that must be carried in order to have an adequate ICT infrastructure. Even so, many school districts still are far from the funding required to support a total cost of ownership approach to the technology which is in place.

ISTE's work in developing ICT standards for teachers has played a major role in clarifying the skills needed by teachers in order to use ICT as a valuable teaching resource. The ISTE teacher standards have provided an significant impetus and focus for professional development of teachers.

In the past three or four years, increased attention has been devoted to the need for the involvement of administrators as a critical aspect of efforts to make effective use of ICT. The Technology Standards for School Administrators Project (TSSA) was initiated because of the recognition that until we have the active involvement of school administrators, even with the best individual efforts of teachers who use ICT effectively, the impact of ICT will never be what it can and should be. The TSSA standards were adopted by ISTE as NETS*A, and ISTE will play a major role in providing professional development on the Standards. The Bill and Melinda Gates Foundation State Challenge Grants for Leadership Development project that began at the same time as the work on the TSSA Standards was being completed has also played a major role in improving the ICT capabilities of administrators. These two national efforts were complimentary in that they were focused not on administrators learning computer applications – Excell, Powerpoint, etc. – but on the role of administrators in providing policy and practice leadership as it relates to the use of ICT as a vital instructional and administrative utility.

In the quarter century history of ICT in schools, progress has been made in the use of ICT to add value to the quality of schooling in U.S. schools. I have

visited schools where I have seen ICT used to create powerful and compelling learning environments. More than anything else, it is seeing what is happening in such schools, that leads us to recognize that the expectation we have for ICT can be accomplished. In essence the question is: How do we make what we see in schools where ICT is expanding learning opportunities for kids and bringing new life to classrooms the rule rather than the exception? What are the challenges we must face to make this happen?

What I have to say about the challenges rests on three premises. I will not argue the validity of these premises here, although I believe a good case can be made for them, and I realize that for those who do not share these premises with me may be less sympathetic to the perspective on my position on the seven challenges that follow.

The first premise is: U.S. schools are not providing the education that is needed by a vast number of kids attending them. Drop out rates of 25% and higher in some of our schools is only one indicator of the seriousness of the problem. Equally grim is the large number of kids in our schools who are still in the school buildings but who are being reached only marginally more than those who have dropped out.

The second premise is: While ICT has as of yet not had the breadth of positive impact on changing schools in substantial ways for the better, ICT provides a potent means for helping us to make the needed transformation in how we do schooling in the U.S.

The third premise is: If ICT is to play a role in the creation of a new generation of U.S. schools, structural challenges must be met. Words like “structural” and “systemic” are often used in a rather casual manner in ways that carry a connotation of importance with only a vague denotation. In my usage of the term “structural” I refer to those aspects in the organization which are in place as the context of policies, customs, rules, and roles that define how people are expected to function in the organization. The ideological underpinnings of the organization are also an element of the organizational structure. Guiding beliefs shape the conception of what is legitimate, appropriate, and necessary with regard to organizational processes and goals. Organizations have durability and permanence of functioning and performance even as people in them with differing dispositions and behavior come and go. This is not to say that organizations cannot change but rather to contend that organizational change generally is a result of deliberate modification in structures by those inside the organization or as a result of impinging outside forces. Organizations do not typically morph in response to members whose functioning deviates from that which is structurally sanctioned. Organizations may be more or less permissive with deviants but the consequence of the actions of deviants whether they are good deviants or bad deviants generally has minimal enduring impact on the organization. .

The seven challenges that follow pose quite significant obstacles of political, organizational and structural nature and as such require the involvement of school leaders. The structural changes which decisions on these challenges generate form key elements of the organizational context for ICT in schools and, I would argue, the extent of the positive impact of ICT. When I refer to school leaders I am referring to school administrators but school leadership is not confined to school administrators. Others such as teachers, school board members, parents, citizens, state departments of education, and also kids can and should play leadership roles.

This is a contentious paper. I believe it will have served a purpose, even if my perspective on the challenges I enumerate below is rejected, if it contributes to the needed effort to move discourse on the challenges of leadership in schools pertaining to ICT from platitudes to concrete definition.

CHALLENGE ONE: Curriculum Integration or Curriculum Disintegration?

I have participated in hundreds of conversations about the use of ICT in schools and in these conversations the term “curriculum integration” is almost always prominent. The call for “curriculum integration” comes from those who seek to move computers and other allied technologies from incidental accoutrements, a side-show, to the mainstream of instructional work of schools. On the face of it, the case for the integration of ICT into the curriculum makes perfectly good sense. While, on the face of it, the notion of curriculum integration makes good sense, the problem which often seems to be the one which is being addressed is: How do we get teachers to use ICT? That is not the problem that needs to be solved.

Computer companies may set as a goal getting lots of computers used in lots of ways in schools. (Although, this might not even be a wise self-serving goal for computer companies.), but it is not the task of the educational community to figure out ways to get teachers to use ICT. The task for educators is to make schools better places of learning for the students whom they serve and to involve ICT only when ICT can help them accomplish that task. We should require no additional verification of the fact that simply adding computers does not make schools appreciably better places of learning.

At the tactical level, considerations about integration of ICT into the school program deal primarily with the “how” question: how can we use computers to teach x, y, or z. The “what” and “why” questions are of paramount importance: what should be taught and why should it be taught? These are the two principal curriculum questions which take precedence over the “how” or the instruction question.

There are serious deficiencies in the curricula of many of our schools. Andrew Seaton summarizes the needed changes being advocated by a substantial body of informed opinion. It is instructive that he puts the first six items in

his list which all pertain to the curriculum before the seventh which pertains to instruction. Those who might take issue with Seaton's list of needed curricular changes might try framing the antithesis of his list of seven and considering the reconstituted list as a viable alternative. Seaton begins his paper titled, "Reforming the Hidden Curriculum: The Key Abilities Model and Four Curricular Forms" with the following:

There is growing consensus that education must extend its traditional goal of student mastery of subject-centered scholastic knowledge, to include the development of individuals who can prosper in complex and changing social, cultural and economic worlds. The 'inner intent' of reform efforts being made and advocated widely, could be characterized by these key principles: (1) emphasis on exit outcomes (prospering in the real world); (2) active learning for intellectual quality (constructivism); (3) personal responsibility for own learning and behavior (genuine engagement); (4) individual meaning and relevance (not one-size-fits-all); (5) real-life purposes, roles and contexts (integrated curriculum); (6) links with community for mutual capacity building (productive partnerships in a learning community); and (7) extension of pedagogical repertoires (teachers moving from 'sage on the stage' to 'guide on the side'). However, teachers, schools and systems are having great difficulty resolving some of the contradictions between these principles and practices on the one hand, and pressures of accountability and traditional school culture on the other.⁴

There is nothing in Andrew Seaton's paper about ICT *per se*, but it is work such as this that focuses us on the curriculum which provides the point-of-entry for any effort to make use of ICT to constitute substantive improvement rather than cosmetic change in schools. There is often a disconnect between persons doing serious curriculum work such as that proposed by Seaton and those leading ICT efforts at the district and state level. Curriculum people too rarely talk about ICT and ICT people too seldom about curriculum. It is especially ironic that so many who are closest to ICT in our schools seem to fail to recognize the revolutionary impact that ICT has had on the nature of knowledge and what that means for the nature of the school curriculum. What we as humans need to know and be able to do to be productive members of society has been affected in deeply pervasive ways by ICT. When there is recognition in our schools of the transformational impact of ICT on human culture, we will see consequences of ICT in the curriculum even when we do not see kids pressing keys or moving a mouse.

I use the term "curriculum disintegration" to indicate the need to break open the curriculum, to not accept it as a given, and to reconsider what kids in our schools need to learn as a pre-requisite to the consideration of where and how we insert ICT into instruction. Integrating ICT into the curriculum will do

little if anything to make irrelevant curricula relevant, antiquated information fresh, or useless skills valuable.

Thus, the curriculum issue fits within the category of challenges that require the involvement of school leaders since in most schools important decisions about the curriculum are not the province of individual teachers. It is understandable that many prefer to steer clear of the need to transform the curriculum since this is both a terribly thorny political and substantive set of problems. As more authority for the curriculum shifts from localities to the state and federal levels, the challenge of unlocking the curriculum door becomes even increasingly problematic and requires greater and greater professional and political skill on the part of school leaders. Yet, to accept the curriculum as a given as it exists in many school districts is to put serious or even fatal constraints on the hope for ICT to have transformative impact on schools.

CHALLENGE TWO: Focus on Achievement or Focus on Learning?

Distinguishing between “achievement” and “learning” might seem like a semantic quibble. In common parlance, these two words are often used as synonyms but, they are not synonyms and the distinction between them is quite significant in considerations of the “bottom line” - or the way in which the fundamental purpose of schools, and accordingly ICT, is conceived.

Webster defines achievement as “a thing achieved by skill, work, or courage.” Learning is defined as “the acquiring of knowledge or skill.” In operational terms, school achievement is that which is measured by achievement tests. A good score on an achievement test may or may not be an indicator of learning if we take the word “acquiring” to mean that that learning is owned by the student, is durable beyond the test taking event, and has some value outside of the school setting.

There are those who believe that to raise questions about the value of achievement tests is to shirk accountability. Perhaps some who object to achievement testing may do so because they are incompetent and do not want their incompetence to be revealed but, fearfulness of accountability is not the only reason why one might question a heavy reliance on achievement tests to assess the success of students as learners and to use these tests to draw inferences about the success of teachers in cultivating learning.

Teachers and legislators and other policy makers live in two different worlds. It is not that one is in a good world the other a bad one! It is that they are quite different worlds. The policy maker lives in a world of reports, numbers, committees, and legislation or policy construction. The policy maker needs to have measures of success that cut through all of the complexity, qualifications, and fuzzy realities of schools. Scholastic achievement tests

provide such a measure. To contend that ICT in the schools should raise achievement tests is to identify a goal that policy makers can grab hold of.

The teacher lives in a world of kids and classrooms. This is a world of, complexity, qualifications, and ambiguity. The world of the teacher is one populated by children who, with distressing frequency, bring to school problems that often reflect inability by legislators at the federal and state level to deal with the conditions that cause these problems. Teachers do not have the luxury of pretending these problems are not there. Further, most teachers realize what psychometricians know which is that the totality of the fabric of learning which needs to take place in classrooms can not be reduced to a couple of numbers.

The conflict between these two worlds can result in rather bizarre situations such as that which occurred in Lawrence, Massachusetts which ranked last on the Massachusetts Comprehensive Assessment System. In order to improve the performance of the district which was necessary to cool the political heat caused by the poor showing of the Lawrence School District, a program to teach the students test taking skills was instituted. However, in order to accommodate the instruction, the district had to cut instructional time in the core subjects which included reading – a subject badly needed by the large percentage of students for whom English was the second language. Thus, the district made the decision to reduce the opportunity for kids to learn so they could have time to teach them how to take tests!⁵

Scholastic achievement tests are generally good predictors of success in school. For those who are comfortable setting as the “bottom line” metric for schools a measure of how well schools prepare young people to be successful in schools, conventional scholastic achievement tests are useful. For those who want to know how successful the school has been in enabling students to acquire knowledge and skills which are usable and useful not only in their schools but in their lives, conventional scholastic tests are a far less satisfying metric.

It is more difficult to create assessment techniques that provide information about the capability of the student to have acquired knowledge and skills in a sense of true ownership of that knowledge and skills and to be able to make use of that knowledge in skills in real world situations, but while difficult such is not by any means impossible. This approach to assessment is given the name “authentic assessment,” which, unfortunately, may sound to those outside of schools like educationese and a way to obfuscate and circumscribe conventional achievement tests. Perhaps authentic assessment would have more cachet among people outside of schools if they understood the term to mean that we were using testing to see if students could use their school learning to accomplish something that mattered in the world outside the classroom.

It is instructive to see where authentic assessment is being used, and why it is being used, outside of K-12 schools. For example, the Accreditation Council for Graduate Medical Education is seeking to reform medical education by moving away from the tradition medical achievement tests to authentic assessments which will determine whether newly trained physicians can execute their knowledge in real world settings rather than answer questions about it on a paper and pencil test.

If the goal of a school is to raise achievement test scores, better and more economical ways can be found to do that than installing ICT in schools. Indeed, it may even be the case that ICT could be counter productive, particularly when ICT is most effective since it might engage student interest and involvement in ways which are not productive in terms of the standardized achievement tests. The National Board on Educational Testing and Public Policy report called *Perceived Effects of State-Mandated Testing Programs on Teaching and Learning: Findings from a National Survey of Teachers*,⁷ found that high stakes achievement testing has a strong effect in reducing attention paid to content not covered on the test. Indeed some of the best work being done in classrooms with the use of ICT has been “bootlegged” into the classroom because it doesn’t really fit neatly within the existing curriculum or is not compatible with the standardized achievement testing. To walk into these classrooms is to find learners who are involved in learning experiences that would have been beyond our wildest fantasy ten years ago.

The National Board on Educational Testing and Public Policy reported that one-third of the teachers in “high stakes” tests reported that their school did not use or prohibited the use of computers in teaching writing since the state writing test requires handwritten responses. This, of course, flies in the face of considerable evidence of the value of the use of computers in teaching writing. The same study reported that a substantial majority of teachers indicated that the “state testing programs have led them to teach in ways that contradict their ideas of sound instructional practices...”⁶ Our most gifted teachers find ways to provide these experiences despite pressure to put what may be best to create good learning environments behind what may be best to create good test scores but, the provision of good learning environments should not be despite school, state, or federal policy.

There was small college in Western Pennsylvania called St. Fidelis that had as its motto, “Non Scholae se Vitae Discimus” “We learn not for school but for life.” I believe that college got it right! There is a definite and needed role for leaders to become better advocates for the need for and legitimacy of the implementation of these learning environments in our schools, to stand for what is right for students in classrooms, to better inform their community about the limitations of high stakes testing, and to become involved in efforts to establish the requisite changes and improvements in policy affecting testing. The leadership challenge is to do what is required to enable that motto to be appropriate for every school building in the U.S. Were that to be the case, we

would be one big step closer to getting the best that ICT has to offer for every student in our schools.

CHALLENGE THREE: Professional Development or Organizational Development?

It is almost impossible to have a conversation about ICT in the schools without the issue of the importance of professional development for teachers being raised. This is not surprising since it is obvious that teachers who are expected to use ICT in classrooms need to know how to use ICT. Professional development for teachers is emphasized because it has been so often ignored. Teachers often have been left to get what training they can get when and if they can get it. One cannot argue with the need for more and better professional development for teachers pertaining to ICT. What can be argued is the validity of a belief embedded in the calls for more teacher professional development. The belief in question is this: Teachers who have acquired new capabilities will change the organization to accommodate what they have been trained to do as a natural consequence of the implementation of their new capabilities.

The Association for Training and Development (ASTD) defines organization development as follows:

Organization development is the planned process of developing an organization to be more effective in accomplishing its desired goals. It is distinguished from human resource development in that HRD focuses on the personal growth of individuals within organizations, while OD focuses on developing the structures, systems, and processes within the organization to improve organizational effectiveness.⁸

The contrast between organizational development and professional development is not about whether or not teachers should end up with new capabilities and perspectives. Such is the intended consequence of organizational development as it is with professional development, but organizational development involves explicit attention to changing the organization as the organization members are changed. The premise is that organizational structures – the policies, customs, rules, do not naturally adapt and transform in response to the way the organization members function. Rather, behavior that is in conflict with the organizational structures is something like an organizational pathogen and the organization structure provides its own antibodies which generally overcome the deviant behavior.

Professional development inclines one to explain the lack of effective use of ICT in schools in terms of deficiencies of individuals – usually teachers. They are seen as fearful of technology, Luddites, inadequately skilled, too tied to their own past practices, etc. This explanation, however, fails to work for many situations where motivated and capable teachers encounter obstacles

in their schools which hinder or thwart their ability to do what they are best able to do for their students. Further, this explanation dismisses real problems in schools such as lack of support and the disjuncture between the official curriculum and many of the most powerful uses of ICT. It sweeps these problems under the rug of professional development.

Some of my colleagues at Western Michigan University are working in a cooperative project with the Oak Park Michigan School District that takes an organizational development approach and identifies eight characteristics of such an approach. Working cooperatively with the faculty and staff of the District the initiative aims to:

- Change the organization culture and climate
- Change the policies of the organization
- Change the behavior of the administration
- Change the behavior of the staff
- Change the way we think about how education works
- Change the way decisions are made
- Move away from autonomous behavior
- Move toward team behavior ⁹

There is a well developed set of techniques and understandings that have been produced by organizational development experts and practitioners which are available to school districts who wish to employ this approach. We do not need to do more to equip individuals with skills which make them deviants in terms of the organization. The effort to equip teachers and administrators with ICT knowledge and skills should occur within a context of a modification of the organization so that the impediments and disjuncture between best practices of teachers and the organization are removed. We must also recognize that even as we attack the “digital divide” in society, we must attack the “digital divide” which exists between many of the classrooms in each of our schools. This form of digital divide is a direct consequence of professional development which conceives of school personnel as autonomous individuals rather than as team members who share a common mission within an organization that is structured in harmony with that mission.

CHALLENGE FOUR: Fiscal Conservatism or Fiscal Restructuring?

“Restructuring” became a quite fashionable word in the 1980's. It was used extensively in political, economic, and educational discussions. A “buzzword” is “a word or phrase used by members of some in-group, having little or imprecise meaning but sounding impressive to outsiders.” Thus, the word “restructuring” qualifies as a *bono fide* buzzword; yet, even with all of the muddle that surrounds the word it is clear that those using it are trying to tell us something. What I believe they are trying to say is that what is needed is

radical change. It is “radical” in keeping with the etymology of the word that refers to getting at the root of the problem.

The Benton Foundation and the Center for Children in Technology issued a report called “*The Sustainability Challenge: Taking Edtech to the Next Level.*”¹⁰ According to the authors of this report the U.S. has invested 40 billion dollars into ICT over the past ten years. Yet, this report warns that the investment which has been made is in danger of being lost without further investments. School restructuring has been considered to be a task for directors of elementary and secondary education, and other curriculum and instruction personnel. Yet, ICT raises critical and tough restructuring issues which stop at the desk of the finance and business directors of school districts.

The ICT fiscal issue for schools is framed by four factors:

1. Even though most school districts have taken important strides in the installation of the hardware infrastructures, there are few school districts that can claim that equipment is available whenever and wherever teachers and students need to use it. Were it not for the fact that a considerable number of teachers in most schools do not use ICT to any extent, problems of access would be considerably more problematic the shortcomings would be particularly acute and dysfunctional for the instructional program. The Benton Foundation and the Education Development Center, Inc. Center for Children and Technology report, *The Sustainability Challenge: Taking Edtech to the Next Level* presents a carefully developed case to support the contention that “we need more and smarter investments in edtech, not less.”¹¹
2. Schools generally treat the hardware and networking investment that has been made in ICT in school districts as capital investments, and while some of the installed ICT is properly considered as a capital expenditure, an appreciable percentage of the investment – which includes some of the money spent on hardware - is recurring cost.
3. Using the TCO¹² formulas developed by CoSN (which were designed to reflect budgetary realities of school districts) it is clear that few districts have provided the funding required to support on a TCO approach, the installed base of ICT in the district.
4. There is no indication that funding for schools from local, state, or federal sources will expand to provide new money to cover ICT as an add-on cost at a level which would support the costs indicated in the above three points.

It is not valid to make a one to one extrapolation from the experience with ICT in the private sector to schools, but there is one finding from the private sector experience that is, I believe, valid. There has been no instance of serious use of ICT in corporations that has been accomplished without substantial fiscal restructuring. There is no reason to expect that this will happen in schools. Grants from philanthropic organizations, one time appropriations from the state, federal government project funds, money from philanthropic foundations, and bond issues have constituted the bulk of the investment in ICT along with the funds from the E-Rate (which continues to be on ground more shaky than we would like it to be).

Thus, school districts face the painful task of fiscal restructuring if ICT is to be an essential element in the operation of schools. The tough side of fiscal restructuring for ICT is not the recognition and acceptance of what ICT adds to the budget but what it subtracts. Serious opposition such as that encountered by Jack Christie, the President of the Texas School Board, when he proposed using the 1.8 billion dollars that Texas spends on a six year period for textbooks to purchase laptops can be expected even in more modest fiscal restructuring at the state or local level. It is clear, however, that just as there is a mortal flaw in thinking about ICT in instruction as “business as usual with computers,” so also is there a mortal flaw in thinking about fiscal management pertaining to ICT as “spending as usual with add on money to pay for ICT.”

Schools throughout the US are facing serious financial problems. A case can be made that this is not the moment to face up to the fiscal restructuring issue. However, there is also informed opinion to support the contention that that fiscal restructuring of the type that is needed pertaining to ICT may indeed be most feasible in these times of distress rather than the better economic times for schools. Whether this is the moment or whether this needs to be deferred, fiscal restructuring is essential if ICT is to be an essential element in how we do schooling and how school districts operate. Tradition, local political realities, master contracts, and the very legitimate concern about avoiding “throwing out the baby with the bath water” in a pell-mell rush to ICT will all be in the picture as school leaders attack this problem.

One other point: A considerable portion of teachers time is spent on administrative and other non-instructional tasks. One way to increase the real ratio of teachers to students is to reduce the time teachers spend on tasks that do not involve direct contact with students. Even a relatively modest savings of time via ICT of, say, five percent – or 2 hours on a forty hour week means that in effect one full time teacher equivalency results for each 20 teachers on the staff when ICT enables them to reallocate their time at that level.

CHALLENGE FIVE: 19th Century Education Ideology or 18th Century Education Ideology

In the colonial and early post-colonial era, schools were *a* but not *the* means of providing the knowledge, skills, and dispositions needed by children and youth. The advancement of learning was not synonymous with the establishment of school. Schools were an element in the mosaic of instructional resources in colonial society but, the early Americans believed that the advancement of learning occurred in the household, the farm, the shop, and in the church as well as in the school. *Where* and *how* the learning occurred was less important than *that* it occurred. Each person achieved the required education in a manner which provided the best fit between their life circumstances and the life they were expected to live.

The American Public School was an invention of a cadre of persons of exceptional intellect and dedication in the 19th century as *the* primary agency for the education of the young. The reforms came in the wake of the declining role of the family and church to provide education for the young – especially for those living in the cities. The American Public School was the invention of a cadre of persons of extraordinary dedication, energy, and intellect in the early part of the 19th Century. They established the American Public School as the primary agency in American society for the education of the young. Schools would build patriotic and pious persons equipped with the requisite dispositions and academic skills which they needed as they advanced to adulthood. There was little doubt among the proponents of school reform in Europe and subsequently by those in the United States that schooling, if systematic and properly regulated would be the principal means by which American children and youth would be educated.

While the magnitude of the impact that ICT has had in schools can be debated, there is less room for debate about the impact ICT has had on education in the U.S., if by education we mean the process whereby young people acquire the information and beliefs which they actually use in their lives and if we speak of ICT primarily in terms of the ICT they encounter after the school day is over. The teachers who are teaching our youth history are people like Oliver Stone and Steven Spielberg, Their civics teachers are people like David Letterman and Jay Leno and their teachers of deportment (an area of much concern to the founders of the American Public School) are Eminem, Britney Spears, and other popular media figures. Some may feel that to speak about popular music stars, talk show hosts, and movie people as educators violates the term. They are educators, however, if we take the term to mean persons who, for better or worse are instructing our young people.

During much of the history of the Public School teachers and schoolbooks were the chief sources of information for most young children. With radio, then television, and then computers, teachers and schoolbook are now again only one of many information sources for children. The need is for school

leaders is to recognize and accept the fact that the hegemony of the schools in society as the educational force for our young has ended. Thus, we are actually in an era probably more like the 18th century than the 19th and early 20th centuries as pertains to the education of our youth because of the ubiquitousness and potency of ICT in the non-school hours of the day for our young people. Recognizing and accepting this reality does not at all mean that we fold our tents. It is not beyond the realm of the possible that we could use ICT in schools in ways that approximate the potency of those in the popular media.

There is great need for leadership to do more to bring some of the good work being done on media literacy into our schools and to contribute to efforts to extend and improve work along these lines. Some excellent examples of this are the Center for Media Literacy and the Benton Foundation. We need to take steps to ensure that the positive and accurate education we should provide in our schools can compete with the negative and inaccurate – and extremely powerful - education which is abundant in the world in which we live. This is one of the most pressing and problems facing school leaders in the ICT realm.

CHALLENGE SIX: Research for Advocacy or Research for Improvement?

There is lots of talk these days about the need for more research on ICT in schools. The call for more research is warranted. Some will doubtlessly continue to search for the “Magic Fountain” of ICT research – that study which will convince the unconvinced that ICT is effective and benefits kids. Of course the “killer” study which would prove that ICT improves student achievement and which would pull the teeth of the critics of ICT, that study will never be found since it can never be done. ICT is in schools – as it is in society – to stay. More and powerful ICT educational applications will emerge in the years ahead and it will be the face validity of those applications that will continue to motivate their use in schools. The strongest objection to ICT in schools is ideological not empirical. This perspective will continue to be voiced whether or not we have or do not have empirical studies that “prove” ICT is a good thing to have in schools.

Considering ICT as an independent variable or as a treatment is like doing medical research on the effect of pills to cure illnesses focused on a question such as: Can pills cure disease? The obvious answer to this question is, “It depends” moves us in the direction of framing the agenda of questions as they properly should be framed.

What is needed is research to expand the research base that can enable us to move from trial and error and anecdotes to the establishment of a knowledge base that can be used in moving ahead to build effective ICT applications in

our schools. The improvisation that was perfectly legitimate at the beginning of the story of ICT in the schools is no longer legitimate at this stage of the saga. We should not rely only on the major research organizations or universities to create this research. Much of the type of research which need to occur needs to be come from school districts – perhaps in some instances in partnerships with universities.

To make a bit more concrete the type of research that I believe is needed, let me provide a couple of examples: In the discussion of the fiscal issues, I indicated the need for implementation of ICT in schools which reduces administrative and non-instructional time of teachers to enable such time to be re-invested in direct instructional work with students. Research that assists in understanding how those types of applications can improve the ratio of instructional to non-instructional time that entails metrics pertaining to instructional time for teachers would be quite valuable. Also, many proponents of ICT are proponents because of the belief that ICT improves student engagement in their learning. We lack good means to assess student engagement. Research that produces good instruments for assessing student engagement is needed.

It is also to recognize that many badly underestimate the research base that is useful in dealing with ICT. Anyone who cares to look will find research on ICT in school applications. There is not enough of it and an appreciable amount of it is not usable but there is informative and credible research on ICT in schools applications. Of course, if we can successfully argue that there is no research it gets us “off the hook” from knowing the research that does exist and actually using it. There is a also an appreciable volume of research on learning and teaching that is applicable to ICT. This research has more of a “basic research” quality and may not specifically earmark ICT, this research represents an important element I the knowledge base which should guide policy and practice.

School leaders need to become more involved in efforts to respond to the need for research that can inform ICT practice and policy. In this, as in everything the lack of funds can be perceived as the fatal stumbling block. Creative leadership can find ways around the limitations of funding. An example: One under-utilized resources is the large number of school district personnel involved in graduate education programs who are required to work on research projects and for whom there is often a disconnect between their work day and their university nights. Linkages between districts and universities to establish research programs to be executed by district employees might help to tap the potential of this resource particularly as a means of addressing needed ICT research.

CHALLENGE SEVEN: Education for Work-Force Development or Education for the Pursuit of Happiness.

Few would argue with the words in the document which established America as an independent nation that asserted that “all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty....” But some may balk at the last phrase that completes the sentence: “and the pursuit of Happiness.” The “pursuit of happiness” seems a bit out of kilter and even frivolous in conjunction with “life” and “liberty.” Thomas Jefferson was not succumbing to hedonism in his use of that phrase. The historian, James Farrell provides a clarification of what Jefferson meant by his use of that phrase:

For Jefferson, happiness comes from self-government — the individual's governing of his or her own appetites, outlooks, and actions. It isn't about fulfilling desires; it's about fulfilling the self by fulfilling one's duties. Happiness comes not from play, but from virtue. "Without virtue," said Jefferson, "happiness cannot be." And in a letter to Peter Carr, Jefferson advised his young ward that "health, learning and virtue will insure your happiness; they will give you a quiet conscience, private esteem, and public honor." As Helen Keller said more recently, "True happiness is not attained through self-gratification, but through fidelity to a worthy purpose."¹²

Jefferson deviated from the formula given by John Locke, a philosopher who influenced him. Locke's unalienable rights were life, liberty, and property, but Jefferson contended that property, or wealth, was not an end in itself but only a potential means to the greater human value of “happiness.” In essence, “pursuit of happiness” in the Jeffersonian sense means that one lives a life that is personally satisfying and socially beneficial. As Jefferson's letter to Carr indicates, learning was a key to happiness and self-fulfillment.

It has become standard practice to speak of the function of schools in terms of work-force development. This is a legacy of *A Nation at Risk* that argued the case for school reform on the basis of the need for substantial improvements in U. S. schools in order for the U.S. to remain competitive in the world market. I have argued in this paper of the need for schools to cast off some of the aspects of the past. Yet, the deep concern felt by those who founded the American Public School about the role of schools as the bulwark of the American Republic is a legacy which should not be abandoned. One hears little mention of this these days education circles.

Educational leaders should not be reluctant or embarrassed to oppose those who seek to define the work of the schools simply in terms of the preparation of good workers. Certainly, teachers want their students to get good jobs and contribute to the U.S. economy, but they should oppose those who myopia does not allow they to see students as much more than proactive workers.

Educational leaders should vigorously make the case that we not only want our students to be able to read but to want to read, that we want our students to appreciate the way in which the arts uplift our spirit, and that ultimately our goal is to contribute to the ability of our students to live a life that is self-fulfilling. Those of us who teach should ask ourselves if there is likelihood that what we do as individuals or what our schools as collectives contributes, even in a small way, toward helping our students acquire “fidelity to a worthy purpose.”

Even Jefferson with his brilliance could never have envisioned a world where young people would have such opportunity to acquire information, to learn, to communicate which ICT has provided. Unlike every generation that has preceded us, the opportunity for access to the accumulated knowledge of the culture is not contingent on geography. And while access to the knowledge is still a function of wealth we are closer to eliminating that barrier than we have ever been.

Perhaps, this seventh challenge would be better labeled as an opportunity. To cast what ICT can offer for our young people solely in terms of work force development is to be shortsighted in the opportunity it provides to establish a ubiquitous life long source of education and the opportunity it provides for educators to play a role in helping to make the opportunity a reality for our young people in their lives both in schools and outside of schools.

In this paper, I have presented my sense of the seven challenges for leadership in the use of ICT as we move into the next era of our use of ICT in our schools. I expect disagreement in my nomination of the challenges and in what I have said about them. Yet, since I recognize that even as a university professor I am not gifted with omniscience, disagreements on these matters can help to correct my misperceptions and to clarify and sharpen the definition and understandings of the challenges we need to overcome in order to make ICT work for our youth.

¹ I accidentally discovered after writing this paper that the Winston Churchill quote was used by Bill Gates in a speech he gave about a year ago. I considered eliminating the quote but decided that the opportunity to use some of Churchill's prose with an imprimatur from Gates was an opportunity too good to pass up.

² This figure was provided by the Funds for Learning, Washington, D.C. and is based on their analysis of the E-rate funding history.

³ Technology Counts 2002, *Education Week on the Web*, <http://www.edweek.org/sreports/tc02/>

⁴ Seaton, A. 2002, 'Reforming the Hidden Curriculum: The Key Abilities Model and Four Curricular Forms', *Curriculum Perspectives*, vol. 22, no. 1, April, pp. 9-15.

⁵ Vogler, K.E. and Kennedy, R.J., "A View from the Bottom: What Happens When Your School Ranks Last?" *Phi Delta Kappan*, February, vol 84, no 6, February 2003, pp. 446-448

⁶ National Board on Educational Testing and Public Policy, *Perceived Effects of State-Mandated Testing Programs on Teaching and Learning: Findings from a National Survey of Teachers*, Boston, Massachusetts: Boston College, March, 2003

⁷ National Board on Educational Testing and Public Policy, *Perceived Effects of State-Mandated Testing Programs on Teaching and Learning: Findings from a National Survey of Teachers*, Boston, Massachusetts: Boston College, March, 2003, p. 3

⁸ Association for Training and Development http://www.astd.org/CMS/templates/index.html?template_id=1&articleid+27485

⁹ http://www.oakparkschools.org/district/rope/OPSD_degree_pgm_outline.PDF

¹⁰ Benton Foundation and Education Development Center, Inc. Center for Children and Technology, *The Sustainability Challenge: Taking Edtech to the Next Level*, Benton Foundation, 2003

¹¹ Benton Foundation and Education Development Center, Inc. Center for Children and Technology, *The Sustainability Challenge: Taking Edtech to the Next Level*, Benton Foundation, 2003, p.10

¹² Consortium for School Networking, Taking TCO to the Classroom <http://www.classroomtco.org/>

¹³ http://www.wcal.org/archives/dramerica/america_pursuithappiness.html

