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University of Nebraska at Lincoln

HISTORY IN THE DIGITAL AGE

Lawrence K. Grossman

Given the title of this conference, I thought I'd introduce my talk with an oddball historical anecdote, a wacky story I recently found on line. Then I'll go straight and briefly focus on three remarkable precedents from American history that are especially relevant to this lunchtime subject.

They're relevant because what the Digital Promise Project proposes to do will, we hope, make history itself by helping to transform education, workforce training, and lifelong learning for the digital age. And all of you can play an important part in making it happen.

The oddball story goes like this: A French archeologist recently drilled down 2000 meters on the outskirts of Paris and found what appeared to be strands of ancient copper. The French announced that the copper strands suggest that they must have been the first to discover the telephone and possibly even cable.

Not to be outdone, a British archeologist dug down 3000 meters in London and came across a few ancient pieces of fiber, which led the British to suggest that they were the first to discover fiber-optics.

In Jerusalem, an Israeli archeologist dug down 5000 meters and found absolutely nothing. The Israelis announced they were the first to use wireless.

Sorry about that. You've got to be careful about what you learn on line.

Now for a legitimate history lesson: Once each century, in each case during a time of grave national crisis, Congress passed stunning and farsighted legislation – extraordinary initiatives that transformed American education, training and learning and were critical to the progress of the economy and the development of the nation. Two of those innovative laws used a publicly owned resource, namely public land – frontier land -- to foot the bill.

One of the very first measures that Congress passed, while the original 13 states were still reeling from the Revolutionary War and governed by the weak Articles of Confederation, was the Land Ordinance of 1785, a breathtakingly farsighted law. After the Constitution was ratified, the Land Ordinance was incorporated into the formative Northwest Ordinance of 1787.

What made it so visionary? The ordinance required every new state, before being admitted to the union, to reserve a section of public land that would be used to pay for public education. The Northwest Ordinance started public education in the young republic, in fact in the world. Its goal was nothing less than to make every new citizen literate and informed.

A century later, during the darkest days of the Civil War, with Washington under siege, Congress passed and Lincoln signed the Land Grant Colleges Act of 1862, after years of Congressional wrangling. It was called by historian Alan Nevins the most farsighted legislation in the nation's history. As with the Northwest Ordinance, the Land Grant Colleges Act required public land to be set aside in every state to help finance public higher education.

Why? To increase our young nation's competitiveness with Europe by developing more productive agriculture and more advanced manufacturing. The Land Grant Colleges Act and its successors, enabled farmers and workers, and then freed slaves, and Native Americans to get a college education for the very first time. The result is today's remarkable network of 105 outstanding public research universities serving every state in the union. The University of Nebraska system is one of those land grant institutions, as is the Nebraska Indian Community College

And in the 20th century, in the midst of World War II, Congress passed the GI Bill, actually named the GI Bill of Rights or the Servicemen's Readjustment Act of 1944. After much debate about the GI Bill's costs and benefits, the legislation came out of committee by just one vote. The GI Bill opened higher education to millions of veterans, gave them extraordinary opportunities, and helped bring unprecedented post-war prosperity to the nation.

Now in the early years of the 21st century, we are still just at the frontier of the fast changing digital and information age. Never have education, training and lifelong learning been more essential. The commercial world is racing ahead at breakneck speed, embracing the new information technologies. It is time to follow in the footsteps of our enlightened forefathers. Together, we must take on the challenge to ensure that these stunning new digital information technology advances will also be used to serve the public interest.

Since the new century began, commission after commission has focused, with a growing sense of urgency, on the U.S.'s need to transform education and training, if only to keep America competitive in the information era's global economy.

In 1999, a group of major foundations, led by Carnegie and Century and including Knight, MacArthur, and Open Society, took these warnings to heart. They expressed concern that the Internet and the new Information Technologies were beginning to revolutionize virtually every commercial aspect of our society – our financial practices, industrial processes, communications, and national defense.

But they worried that the public service uses of advanced information technologies by our great nonprofit institutions – our schools and universities, our museums and libraries, our cultural and public health centers, many of them the repositories of the DNA of our civilization, were being left far behind. The country had failed to develop any public policy to stimulate the public interest uses of these powerful, advanced new technologies that were coming on line.

The foundations asked former FCC Chair Newton Minow, of “vast wasteland” fame, and me to take on the job of recommending what our public policy should be that would encourage use of the new and advanced information technologies in the public interest.

Newt and I agreed to accept the challenge on a *pro bono* basis as long as we not only would publish a report of our findings, but also could work to get them implemented.

We spent more than a year interviewing hundreds of experts – academics, business leaders, scientists, librarians and museum officials, sociologists, and others, who were just waking up to the enormous potential of the digital world. We commissioned 17 research papers. And in 2001 we published our findings and the papers in a book -- “A Digital Gift to the Nation – Fulfilling the Promise of the Digital and Internet Age.”

We found that this nation spends almost a trillion dollars a year on education and training, and virtually nothing comparable on R&D to advance education and training for the new century. And most of the funds for education and R&D are locked in the Dept of Defense, where the fruits of those investments are not made available to the general public.

We recommended that the Federal Government establish an independent research and development trust fund, modeled on the National Science Foundation, that would do for education, training and lifelong learning what NSF does for science, what NIH does for health, and what DARPA does for the military. We labeled the trust fund that we proposed the Digital Opportunity Investment Trust because it has the mnemonic DO IT.

DO IT would provide major financing for innovation, research and development in applying advanced information technologies to transform education, skills training and lifelong learning. It would fund the digitization of collections and other significant holdings in our nation’s libraries, museums, universities, public TV stations, and other public institutions, to make these riches available to rural, urban, and suburban America, as well as to the rest of the world. It would deal with rights and standards issues.

DO IT would fund the development of sophisticated simulations; applying advances in cognitive science to educational software. It would help develop more authentic and individualistic assessment methods. Content development funded by the trust would include interactive vocational materials for workforce retraining, lifelong learning support, and emergency and safety training for first-responders and the general public, for terrorist and other man-made and natural disasters.

And DO IT would encourage America’s brightest researchers to partner with universities, museums, libraries, and other public service institutions, as well as the corporate sector, to develop innovative learning models, software tools and

prototypes to enable rapid advances in learning and information technology for the digital age.

Federal research partnerships with the private sector will also be a key to DO IT'S success. As the president of the Federation of American Scientists Henry Kelly remarked recently, "From the Morse telegraph in 1842 to modern jet engines to the Internet, the government has played a major role in U.S.-led innovation. Approving DO IT legislation," Dr. Kelly concluded, "could be one of this Congress's great legacies."

Since we began, others have joined our call. The recent National Academy of Science report, "The Gathering Storm," concluded that the country's outdated education and workforce development systems are inadequately preparing American citizens for the jobs and global competition of the 21st century.

The Council on Competitiveness, a major corporate group's recent report entitled "Innovate America," urged that our great national priority should be to enhance learning and workforce training.

The President's distinguished Information Technology Advisory Committee (PTAC) gave its "overarching recommendation" to Pres. Bush: "to make the effective integration of information technology with education and training a national priority." In addition, through the prestigious and influential conservative think tank the Mercatus Institute, we commissioned distinguished economist Thomas Stratmann to take an independent look at this question. His conclusion: the best economic investment the federal government can make is to transform our learning and training systems and develop new and innovative technologies that will help us do so.

According to a just released report from the Department of Education, by 2003 an astonishing 91% of students in nursery school through grade 12, and age 3 or older, used computers and 59% of them used the Internet. 80% of students already use computers by the time they are in kindergarten and the majority -- 56% -- use the Internet by the time they are in fourth grade. Among high school students in 2003, 97% used computers and 79% used the Internet.

Yet, the U.S. Departments of Education and Commerce, in a joint report, concluded: "Education is the only business still debating the usefulness of technology...We still educate our students based on an agricultural timetable, in an industrial setting, yet tell students they live in a digital age."

You folks, sitting in this room, can make a difference. In what is most relevant for this conference, the American Council of Learned Society's Commission on Cyber infrastructure for the Humanities reported, "We should place the world's cultural heritage – its historical documentation, its literary and artistic achievements, its languages, beliefs, and practices – within the reach of every citizen." The ACLS Commission concluded, "The value of building an

infrastructure that gives all citizens access to the human record and the opportunity to participate in its creation and use is enormous...in order for the future to have a record of the present we need legal and viable strategies for digital preservation, ...Investments need to be made on the basis of research, and in this case a good deal more research is needed on digital preservation, on tools, and on uses and users of digital collections, in academic settings and beyond.”

The Congressionally appointed, bipartisan Web-Based Education Commission urged Congress to make possible the development of “high quality online educational content that meets the highest standards of educational excellence...embrace an e-learning agenda as a centerpiece of our nation’s federal education policy.” It urged the federal government “to create a comprehensive research, development, and innovative framework for learning technology...as a central goal of telecommunications policy.”

And finally, the most influential U.S. Commission on National Security in the 21st Century (the Hart-Rudman Report) warned: “The inadequacies of our systems of research and education pose a greater threat to U.S. national security over the next quarter century than any potential conventional war that we might imagine. American national leadership,” the Report insisted, “must understand these deficiencies as threats to national security. If we do not invest heavily and wisely in rebuilding these two core strengths, America will be incapable of maintaining its global position long into the 21st century.”

As you historians know better than anyone, legislation can be a long and agonizing process. After hearings in 2003, Congress appropriated modest funds to the Federation of American Scientists, the Digital Promise Project’s major coalition partner in Washington, to develop a report to Congress that includes a learning R&D Roadmap for the digital age. The Roadmap involved the work of hundreds of the nation’s leading scientists, academics, learning specialists, and others.

Based on that Report to Congress, legislation was introduced in both Houses: The Digital Opportunity Investment Trust Act (S 1023 and HR 2512). Under the acts, an independent Board of Directors for the Trust would be nominated by the Congress and appointed by the President. Money for the fund will come from the interest on revenues obtained from congressionally mandated auctions of the publicly owned telecommunications spectrum, the radio and TV frequencies. These frequencies are the 21st century’s equivalent of the land grant precedent, the publicly owned frontier land of past centuries that helped finance public education and public higher education. The goal is to achieve an R&D Trust Fund with a billion dollars a year to spend.

The DO IT legislation has been endorsed by virtually every national education, library, and museum organization, the major teachers’ and communications workers’ unions, the National Council of Mayors; the Chairs of the

National Science Board. It's been endorsed by Internet inventor and winner of the Presidential Medal of Freedom Vint Cerf; by former Sen. Warren Rudman, chair of the U.S. Commission on National Security in the 21st Century, and by numerous CEOs of high tech companies concerned about the quality of the American workforce in the digital age.

DO IT's Congressional sponsors include leading Senators and Congressmen from both parties – among them Sen. Dodd, Democrat of CT; Sen. Snowe, Republican of ME; Sen. Burns, Republican of MT, and Democratic Sens. Durbin of IL and Kennedy of MA., as well as, on the House side, Chairman Ralph Regula, Republican of OH; Congressmen Markey, Democrat of MA; Wolf, Republican of VA, and many others.

Internet inventor Vint Cerf, in a letter to DO IT supporter, the powerful Communications Committee Chair Joe Barton, Republican of TX, pointed out that, "Federal research investment has been essential for maintaining America's economic leadership and security for generations. [DO IT's] legislation," he wrote, "would not only represent a high-leverage investment in the future of American education, it also would be a critical new application of the revolution in broadband communications...The research envisioned by the DO IT legislation can yield enormous public benefits...In a very real sense, today's R&D agenda determines where America will find itself in the future," Cerf concluded.

I end with the comments of Republican Thomas Bliley, former House Commerce Committee Chairman, in an op ed piece he wrote for the Congressional publication The Hill, "Soon, I predict, every inner-city school will have...the resources of our greatest universities and every rural clinic will be able to draw on the latest discoveries at the Mayo Clinic and Sloan Kettering...Imagine using the Internet to teach first responders – police, fire and emergency medical technicians – how better to respond to emergencies...That same technology could teach unemployed workers new job skills – on their own time, at their own pace and in their own homes...Congress and the White House must act, and soon. Happily, there's a solution on the horizon...It's called the Digital Opportunity Investment Trust. DO IT."

Thanks in large part to the work of DO IT supporters, Congress and several federal agencies have funded the development of three prototypes of educational games. Their purpose: to demonstrate what DO IT can accomplish. You'll find samples from them on our website: digitalpromise.org.

One game in science: ImmuneAttack," a fascinating educational game that shows high school and college biology students how the immune system works by embedding the student players in an army of white corpuscles mobilizing to fend off attacks by infectious agents.

One game in the humanities: “Discover Babylon,” demonstrates how archeologists searched for and uncovered the origins of writing, numbers, and geometry in ancient Mesopotamia, the ancient civilization that existed where Iraq is today.

And the third game, for training: “Mass Casualty Incident,” produced in cooperation with the NYC Fire Department, enables responders anywhere in the world to train to respond to high rise fires. All this content, this software, will be available to everyone in the U.S. and beyond after it has been completed and tested.

Imagine beyond your blackberries, beyond your iPods, beyond your computer screens, even beyond the Internet. Imagine a virtual reality of the Constitutional Convention that would allow the young viewer to “talk” to our founding fathers and to see how their decisions affected American history. Imagine haptic technology that will add a sense of touch to virtual reality. Imagine how much that will mean for workforce training, medical science, and surgical practice. Imagine a digital human body that will allow medical students to explore the course of diseases and their cures.

To learn more, to take an active role in this moment of history, and to follow the Digital Trust’s progress, visit our website: DigitalPromise.org. On the site’s “Take Action” and “Contact Congress” pages you will find draft letters to your own members of Congress, and easy to follow information about how you can reach out to them. They’re just a few clicks away. Nebraska’s Sen. Ben Nelson is on the key Commerce Committee, and Sen. Chuck Hagel is one of Congress’s leaders. With your support, we’ll earn theirs.

Together, we can DO IT.

Thank you.