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RESULTS

A Digital Promise Becomes a Reality: A major new National Center for Research in Advanced Information and Digital Technologies, created nearly a decade after it was first proposed, has boundless potential for revolutionizing the way we learn and how we develop critical thinking skills.

In 1998 more than 40 percent of American households had computers; within two years that figure jumped to 51 per cent. The digital age was in full swing and beginning to dramatically change the landscape of our lives.¹ Recognizing the need to ensure public access to this new digital technology and its unprecedented impact on the dissemination of knowledge, Lawrence K. Grossman and Newton N. Minow, both pioneers in public television, suggested to Richard C. Leone, president of The Century Foundation

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(formerly The Twentieth Century Fund) and Vartan Gregorian, president of Carnegie Corporation of New York, that they convene a group of leaders from schools, universities, libraries, museums and public broadcasting companies across the country to explore this issue. From the discussion at this meeting, it became clear that these institutions were being left behind in the information revolution, and meeting participants unanimously agreed that there was a need to develop policy regarding the uses of the new information technologies in the public interest. As a result, presidents Leone and Gregorian asked Grossman and Minow to head a study that would formulate specific recommendations. They conducted extensive research and presented their initial findings at a 2001 Carnegie Forum, suggesting that a Digital Opportunity Investment Trust (DO IT) be established to continue the research. These meetings marked the start of a challenging decade-long journey that recently culminated in the establishment of the National Center for Research in Advanced Information and Digital Technologies.² The launch of this National Research Center is expected to have far-reaching implications for the formal and informal education of people of all ages and for skills training.

Grossman is former president of NBC News and PBS; Minow is former chair of the Federal Communications Commission, PBS and the RAND Corporation and former chair of the Carnegie Corporation Board; both have served on a pro bono basis as co-chairs of the Digital Promise Project³ since its inception. (See sidebar.) “Grossman and Minow have dedicated their lives to the media,” says Geri Mannion,

¹ <http://www.census.gov/prod/2001pubs/p23-207.pdf>

² The National Research Center (also known as Digital Promise) was established by Congress in 2008, and its first nine-member Board will be selected by Secretary of Education Arne Duncan from a panel of nominees representing a wide range of disciplines; candidates will be proposed by the majority and minority leaders of the U.S. House of Representatives and the Senate.

³ The terms “Digital Promise” and the “Digital Promise Project” were the first names given to the project; “Digital Opportunity Investment Trust (DO IT)” was the name of the proposed research center, which Congress renamed the “National Center for Research in Advanced Information and Digital Technologies.” That name is sometimes shortened to the “National Research Center” and is occasionally referred to by other terms, including “Digital Promise.”

program director, U.S. Democracy and Special Opportunities Fund, National Program. “They remain very committed to ensuring the public interest in the digital age is protected, as is Carnegie Corporation.”

In a nonpartisan show of support, Congress approved the creation of the National Research Center on July 31, 2008, as an amendment to the Higher Education Act of 1965; it became law two weeks later when President George W. Bush signed the act on August 14, 2008. The National Research Center is an independent, nonprofit 501(c)(3) group, meaning that it can receive public funds from the Department of Education and other relevant agencies such as the departments of Defense and Homeland Security as well as private funds from corporations, individuals and foundations. The Department of Education has allocated \$500,000 for the National Research Center’s initial operating expenses. Although this is only a small percentage of the \$50 million that was requested, Minow points out that the National Science Foundation was launched with a few hundred thousand dollars and its budget request for FY 2011 is more than \$7 billion.

As legislation authorizing the new center states, “The purpose of the Center shall be to support a comprehensive research and development program to harness the increasing capacity of advanced information and digital technologies to improve all levels of learning and education, formal and informal, in order to provide Americans with the knowledge and skills needed to compete in the global economy.” The launch of the National Research Center has far-reaching implications for the research and development of more effective and engaging learning experiences that capitalize on the use of advanced information technologies such as virtual reality, simulations and educational games that will promote and enrich lifelong learning and help students of all ages hone their ability to think strategically, solve problems and develop other advanced skills. When the Board is appointed, it will set priorities for the Center; in addition to research and development efforts, this may include digitization of materials in libraries, museums, schools and universities so that these institutions can more fully share their collections.

“This National Research Center will affect every part of our

society; it has the potential to do wonderful things for our education, both formal and informal, and at every learning level; for lifelong learning and for skills training, which is critical for jobs in this new information environment,” says Grossman. “We spend almost a trillion dollars a year on education and training and less on learning research than companies spend on potato chip research, so this has come about at the right time, even if it is a little late in the game.” Grossman says that the National Research Center, properly financed, can do for education and learning what the Defense Advanced Research Projects Agency does for the military, the National Science Foundation does for science, and the National Institutes of Health does for health.

Congressman John Yarmuth (D-KY), who helped get the bill passed in the House of Representatives, says about the possibilities represented by the National Research Center, “In Kentucky we have many very poor remote areas upstate such as Pippa Passes (population less than 300), where a student could have access to the same resources that somebody in the best schools in Louisville could have.” He also pointed out that “Students learn in [many] different ways, but our model is a teacher teaching them all in the same way. The ability of technology to accommodate individual learning styles, to provide immediate feedback and instant evaluation can make the educational experience so much more effective.”

Since 1999, Carnegie Corporation of New York has provided a total of \$425,000 to support various aspects of planning, research and development of the National Research Center, beginning with a grant of \$200,000, which funded the project by Grossman and Minow that resulted in publication of *A Digital Gift to the Nation: Fulfilling the Promise of the Digital and Internet Age* (The Century Foundation, 2001). In addition, other grants were awarded to the Federation of American Scientists (FAS, which administered the funds for the Digital Promise Project) by The Century Foundation, The John S. and James L. Knight Foundation, the John D. and Catherine T. MacArthur Foundation, Microsoft, the Open Society Institute and the Department of Education. FAS spent its own funds for this project and contributed toward the development of video games that

were used to support the establishment of the new National Research Center. “This shows what a small amount of foundation money combined with fervent supporters can accomplish,” says Mannion.

Edee Bjornson, a former official at the Markle Foundation, was the first project director of the Digital Promise project. Anne G. Murphy, who was project director of Digital Promise for many years before becoming a co-chair (and is a former director of the American Arts Alliance), says that Carnegie Corporation funding was “extraordinarily crucial to us. Their investment will make a lasting difference. The risk that Carnegie Corporation took in helping to examine these questions shows how forward thinking they are.”

In looking back over the years the three co-chairs have worked together, Grossman says, “Newt and I got to know Anne from her admirable work at PBS in the early 1980s when he was its chair and I was the president. We were extraordinarily lucky to reach out to Anne and have her come on board Digital Promise during its Washington phase. She deserves the lion’s share of the credit for finally making Digital Promise happen.” Since becoming the third Digital Promise co-chair three years ago, Murphy, like her colleagues Grossman and Minow, has worked on the project on a pro bono basis.

Historic Precedents

During each of the last three centuries there have been major pieces of legislation that reshaped and expanded the scope of American education. Among them, the Northwest Ordinance of 1787, which was originally drafted by Thomas Jefferson and signed into law on August 7, 1789, provided funding for public schools throughout the United States through the sale of publicly owned land. During the next century the Morrill Land-Grant College Act of 1862, which was proposed by Representative Justin Smith Morrill of Vermont, provided land for colleges throughout the United States; it was signed into law on July 2, 1862 by President Abraham Lincoln in the midst of the Civil War. During the 20th century, President Franklin Delano Roosevelt signed the GI Bill (the Servicemen’s Readjustment Act of 1944),

which provided for education and other benefits for World War II veterans. Over the next twelve years as a result of this bill nearly eight million veterans benefited from advanced education or training.

These three landmark pieces of legislation had substantial and long-lasting effects on our educational system, our economy and our society. It is this type of transformative impact that the National Research Center—which became a reality as a result of legislation passed in the 21st century—aims to achieve by researching new technologies and how they can be harnessed to enhance the learning experiences and expertise of students of all ages and backgrounds. This will require a multipronged effort. Murphy says, “The big change that is happening in [society] now—and this project exemplifies it—is that we are moving out of a narrow base of looking at questions such as how should we educate a workforce, what kind of training should we develop for teachers, or whatever the question is. We need to look more at how to integrate what we are doing in business with education and with other disciplines across the lines, so you are not just having educators look at a question, but you are having educators, scientists, corporations, and military experts look together at these questions. Everyone thinks differently, so we need to do more team funding.”

According to the DO IT management report, “The U.S. now spends on the order of \$123 billion annually on research and development. . .Funding for education technology research is difficult to pin down since it is supported by several agencies. A reasonable estimate is that total spending is on the order of \$200–300 million per year—with the Department of Defense accounting for the vast majority of this spending.”

Director of the Office of Educational Technology in the U.S. Department of Education, Karen Cator says, “We need to have a concerted focus on research and development, specifically on how technology can improve the opportunity to teach and learn and create a more efficient system. The National Center for Research in Advanced Information and Digital Technology is going to be able to keep track of these research and development efforts and fund very specific projects. We are excited to see this work begin!”

A Long Road

With formation of the Digital Promise Project, a mission emerged to develop ways to transform learning with new digital technologies. “We are recommending something sophisticated and all-embracing. From the beginning our goal was to support ways that the developing digital technologies could be harnessed to transform learning—cradle to grave,” says Murphy. “Our mission hasn’t changed over the years, but the technology has, and the activities supported by the center are apt to continually reflect future changes in the technologies. This organization is meant to be transformative, not incremental, it’s work akin to the work done by the Defense Advanced Research Projects Agency for the Department of Defense. For example, we don’t want to improve a video game that already exists; we want to look at the concept of gaming and how that can be integrated into the educational framework of society.”

More than 300 distinguished thinkers from many different disciplines were consulted and a group of background papers on digital perspectives were developed and published in *A Digital Gift to the Nation*; a list of all the committed citizens who participated is included in an appendix to the book. In the executive summary of the report, Grossman and Minow discuss the “urgent need to bring the benefits of advanced technologies to all citizens” and propose a far-ranging list of recommendations that “would have the potential to strengthen our economy, educate and inform our children, train teachers, improve skills of workers, serve people with disabilities, and enrich the lives of the growing population of older adults.”

In 2003, the Digital Promise Project joined forces with the Federation of American Scientists, which counts among its members most of the U.S. Nobel laureates in science. The Federation of American Scientists agreed to be the fiduciary agent for the Digital Promise Project, adopted the project’s goals and Grossman joined their Board. Later that year, in response to draft legislation, Congress recommended that the Digital Promise Project undertake the development of a Report to Congress that would include background information, a needs assessment and a road map outlining the research necessary to accomplish these goals, allocating

\$750,000 to fund the effort. The Digital Promise Project joined with the Federation of American Scientists' Learning Federation, which is composed of more than 100 leaders in science, research and academia with expertise in technology and education, to develop a Learning Road Map. Their findings were incorporated in the official Report to Congress.⁴ That report led to the development of new legislation S. 1023 and H.R. 3631.⁵ The links to all bills are on the Digital Promise Web site (<http://www.digitalpromise.org>) under "Legislative Resources." Subsequently, three prototype video games—*Immune Attack*, *Discover Babylon* and *Multi-Casualty Incident Commander*—were developed under the guidance of the Federation of American Scientists to provide examples of how new technologies can be effective education tools. (Link to videos: <http://www.fas.org/programs/itp/games/index.html>.)

After a decade-long national effort, Congress established the National Research Center in 2008. It represented the culmination of a bipartisan effort by many members of both houses of Congress. Senator Christopher Dodd (D-CT), who had been a supporter since the beginning of the effort, says, "The National Center for Research in Advanced Information and Digital Technologies will revolutionize the way we use digital information technologies in our education and training systems. The development and use of this technology is a long-awaited necessity that many other countries have already invested in, and this national center will be a huge step in the advancement of American education and training."

Ralph Regula, who retired in January 2009 as a (Republican) representative from Ohio, and who is a former teacher and principal, was an early supporter of the Digital Promise Project. "We're in the information age, and we probably will see that world explode. Having this kind of capability is part of that whole development," says Regula. "It's the future, and I certainly commend Mr. Minow and Mr. Grossman for moving forward in this area and trying to get ahead of the curve."

⁴ http://www.digitalpromise.org/Files/Report/Final_Roadmap.pdf

⁵ Senate Bill 1023 and the House of Representatives Bill 3631 were incorporated with changes into Section 802 of the House of Representatives Bill 4137, the College Opportunity and Affordability Act, which reauthorized the Higher Education Act. It was enacted on August 14, 2008, Public Law 110-315.

Justin Smith Morrill

Born in Vermont in 1810, Justin Smith Morrill had only a secondary school education and left school at 15; yet he was an ardent student who was self-educated in many disciplines. After operating a dry goods store for many years, Morrill retired from the business in his late thirties and turned his attention to farming. In 1854 he was elected to Congress and served for 44 years, first in the House of Representatives and then, beginning in 1867, in the Senate. As the Republican head of the Senate committee of Public Buildings and Grounds he was instrumental in creating the Library of Congress, and as Craig L. LaMay describes in *A Digital Gift to the Nation*, Morrill's "most notable legacy, the 1862 Land-Grant College Act, extended the possibility of higher education to the masses including such traditionally disenfranchised groups as women and African Americans."

"He was one of my heroes and he was a hero also of James Jeffords (former senator from Vermont and a supporter of the National Research Center legislation)," says Minow. "Morrill was an uneducated farmer who dreamed everyone should have an education, which he didn't have, and he pushed the Land-Grant College Act year after year. It finally passed during the Civil War; Lincoln signed it at the same time as he signed the transcontinental railroad legislation. As a result we have more than 200 colleges and universities and have educated millions of people, all because the federal government gave to the states federal property on condition that the states would either use it to build a college or sell it and use the money to build a college." When asked what Morrill would have thought about the new National Research Center, Minow paused for a moment before saying, "I think he would ask, 'why did you wait so long?'"

For lists of the land-grant colleges and federal legislation that supported land-grant education and to read more about Morrill and the history of the Land-Grant College Act, see "Justin Smith Morrill and the Politics and Legacy of the Land-Grant College Acts" in *A Digital Gift to the Nation: Fulfilling the Promise of the Digital and Internet Age (The Century Foundation, 2001)*.

Throughout the ten-year process to pass the bill, many senators and representatives from both sides of the aisle were active supporters, including, among the Democrats, the late Senator Edward M. Kennedy (MA) and Representative Patrick J. Kennedy (RI). When the bill that finally became law was first introduced in the Senate, its lead sponsors were Senators Dodd, Olympia Snow (R-ME), Conrad Burns (R-MT) and Richard Durbin (D-IL). In addition to Representatives Yarmuth and Regula, the leads on the House bill were Representatives Ed Markey (D-MA), Paul Gillmor (R-OH), Rush Holt (D-NV), Frank Wolf (R-VA) and Rick Boucher (D-VA). The final legislation was incorporated into the Higher Education bill.

Unlimited Potential

The path that led to establishing the National Research Center has been a long one, requiring perseverance by its supporters. In looking back over the many obstacles that the Digital Promise Project surmounted, Minow says, “The lesson we learned is, be persistent. In many stages along this journey we could have said, ‘well, we can’t do it,’ but we never gave up and we managed to stay out of any partisan arguments.”

Now that the National Research Center has been established, the process that will lead to incorporation as a 501(c)(3) entity is underway and a list of board nominees is being de-

Conversations With Lawrence K. Grossman And Newton N. Minow

Lawrence K. Grossman

With an impressive career in the media that has spanned more than 50 years, Lawrence K. Grossman has seen many changes in the innovative uses of technology in the media. In 1976, when he became president and chief executive officer of PBS, the chief engineer at the public network spoke to him about distributing programs by beaming them off a satellite miles up in the sky, instead of using the traditional and more expensive coaxial cable on the ground as all the television networks then did. Grossman says he thought it was a poor idea. “I fought it at first,” he says, “thinking it was too risky.” But circumstances changed and he began to rethink the idea of using satellites because they made it possible to transmit several different programs simultaneously, giving the public stations greater choice. Under his leadership, PBS became the first network to broadcast via satellite. In 1984 Grossman became president of NBC News; he introduced that technology to the network, traveling the *Today* show all over the world, and used computers to interconnect NBC News bureaus throughout the world—an industry first.

Grossman credits his wife, Dr. Alberta N. Grossman, with being the first to awaken his interest in research-

ing the digital revolution’s remarkable potential for teaching and learning. She has worked with learning disabled secondary school students and, since the 1990s, with community college students and adults who are non-native speakers of English. Dr. Grossman taught in Greenwich, Connecticut, Washington, DC, Northern Virginia and New York City and served as a professor teaching English as a second language at the Borough of Manhattan Community College, part of New York’s City University. As a teacher, she has been using closed captioned video, audio and texts since the mid-1970s, and in recent years, the Internet. At a time when computer use was not widespread, she studied five students using a word processor for their writing in a resource room for learning disabled students; the findings were published in 1988 in her doctoral dissertation. Dr. Grossman now teaches on a voluntary basis at the International Center in New York City, where she specializes in teaching writing and conversational skills to adults who speak and write English as a second language; she is a strong believer in the research goals of the new national center.

Lawrence K. Grossman is former president of both NBC News and PBS and is a trustee of Connecticut Public

veloped; a management plan, which will help guide the work of the board, can be viewed at http://www.digitalpromise.org/Resources/Research/Management_Plan.pdf. One of the challenges the new board will face is fundraising. “In addition to federal funding, as we go forward, foundations will play a role in leading and looking at (broad) questions and probably investing in some of these ideas along with the corporate sectors and individuals,” says Murphy. “Partnerships are the wave of the future; no one can do anything alone because the questions are too large, and the investment, too great.” It might also eventually be possible for the National Research Center to obtain funding from a publicly owned resource, as the new nation’s public schools did in the 18th

century and the land-grant colleges did in the 19th century. The 21st century equivalent of publicly owned frontier land, which originally supported the development of the nation’s great system of public universities, is this century’s publicly owned broadcast spectrum, unused portions of which are being auctioned off for billions of dollars by the Federal Communications Commission at the direction of Congress. “This would require action by Congress, and it would be fitting for the National Research Center to be supported that way,” says Grossman. “That is our long-term objective.”

In looking back at the decade-long effort to launch the Digital Promise Project, Corporation president Vartan Gregorian says,

Broadcasting. He held the Frank Stanton First Amendment Chair at the Kennedy School of Government, was a senior fellow and visiting scholar at Columbia University and is author of The Electronic Republic: Reshaping Democracy in the Information Age (Viking/Penguin and The Twentieth Century Fund, 1996).

Newton N. Minow

“Larry was the president of PBS when I was the chairman of PBS, so we have a long professional relationship and friendship,” says Minow about their collaboration on the Digital Promise Project. Looking back on the decade-long journey to getting legislation passed to establish the National Research Center, he remembers early in the process a breakfast meeting with Senator Christopher Dodd from Connecticut, where Grossman votes, and with Senator Richard Durbin from Illinois where Minow votes. Both senators enthusiastically agreed to support the proposal.

Reminiscing about his experiences with technological innovations, Minow says that, as head of the Federal Communications Commission during President John F. Kennedy’s administration, he met with a commissioner who wanted to discuss communications satellites. It was Minow’s introduction to this new technology, yet he quickly grasped the importance of it. He remembers

telling President Kennedy that “communication satellites are more important than sending a man into space.” When President Kennedy asked why, Minow responded, “Communication satellites send ideas and ideas last longer than men.”

Although he does not have a technical background, Minow, says that early in the digital age it was clear to him that technology, particularly digital technology, “has to be harnessed for education.” He loves to read newspapers in print, but on a recent trip to Boston to attend the high school graduation of his granddaughter Mira, Minow took along a recently purchased iPad, and says that he “started realizing how easy it is to read the newspapers and magazines on it while traveling.” He added, “The light is going on.”

Minow is former chairman of the FCC, PBS and the RAND Corporation and former chair of the Carnegie Corporation Board. He has served as a member of the board of CBS and the Tribune Company. He is a life trustee of Notre Dame University and of Northwestern University, where he is the Annenberg Professor of Communications Law and Policy. Minow co-authored, with Craig L. LaMay, Abandoned in the Wasteland: Children, Television and the First Amendment (Hill and Wang, 1995), and is senior counsel to Sidley Austin LLP, an international law firm.

CARNEGIE CORPORATION OF NEW YORK
437 Madison Avenue
New York, New York 10022

Phone: (212) 371-3200
Fax: (212) 754-4073
Web site: www.carnegie.org

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“As Carnegie Corporation approaches its centennial year, we are ever-more aware of the landmark achievements in the history of our country that inform our decisions today. The creation of a National Center for Research in Advanced Information and Digital Technologies heralds a new and much needed era that will ensure the rewards of the digital age will be available to everyone, those with wealth and those without, those who live in rural areas and those who live in urban areas, those who are young and those who are elderly. Just as the Northwest Ordinance, the Morrill Land-Grant College Act and the GI Bill stand as seminal achievements in earlier centuries, we look forward to seeing the National Research Center shine in this century as an equally bright beacon.”

Written by: Joyce Baldwin. Baldwin has written on a wide range of topics for many national publications and is author of two biographies for young adult readers.




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