

SCOMM

137:2



HOUSE SPECIAL COMMITTEE ON EDUCATION

STATE CAPITOL, ROOM 106

MEMORANDUM

COMMITTEE MEMBERS

Rep. Mark Neuman
Chairman
Room 432
465-3820

Rep. Carl Gatto
Vice-Chair
Room 411
465-3743

Rep. Bob Lynn
Room 415
465-4931

Rep. Bill Thomas
Room 428
465-3732

Rep. Peggy Wilson
Room 108
465-3824

Rep. Les Gara
Room 418
465-2647

Rep. Woodie Salmon
Room 114
465-4527

Date: March 20, 2006

To: Members of House Special Committee on Education

From: Representative Mark Neuman, Chairman
House Special Committee on Education

Re: Scheduled bills in Education Committee

Tuesday, March 21, 2006, at 11:00 a.m. in Room 106

Consortium for Digital Learning

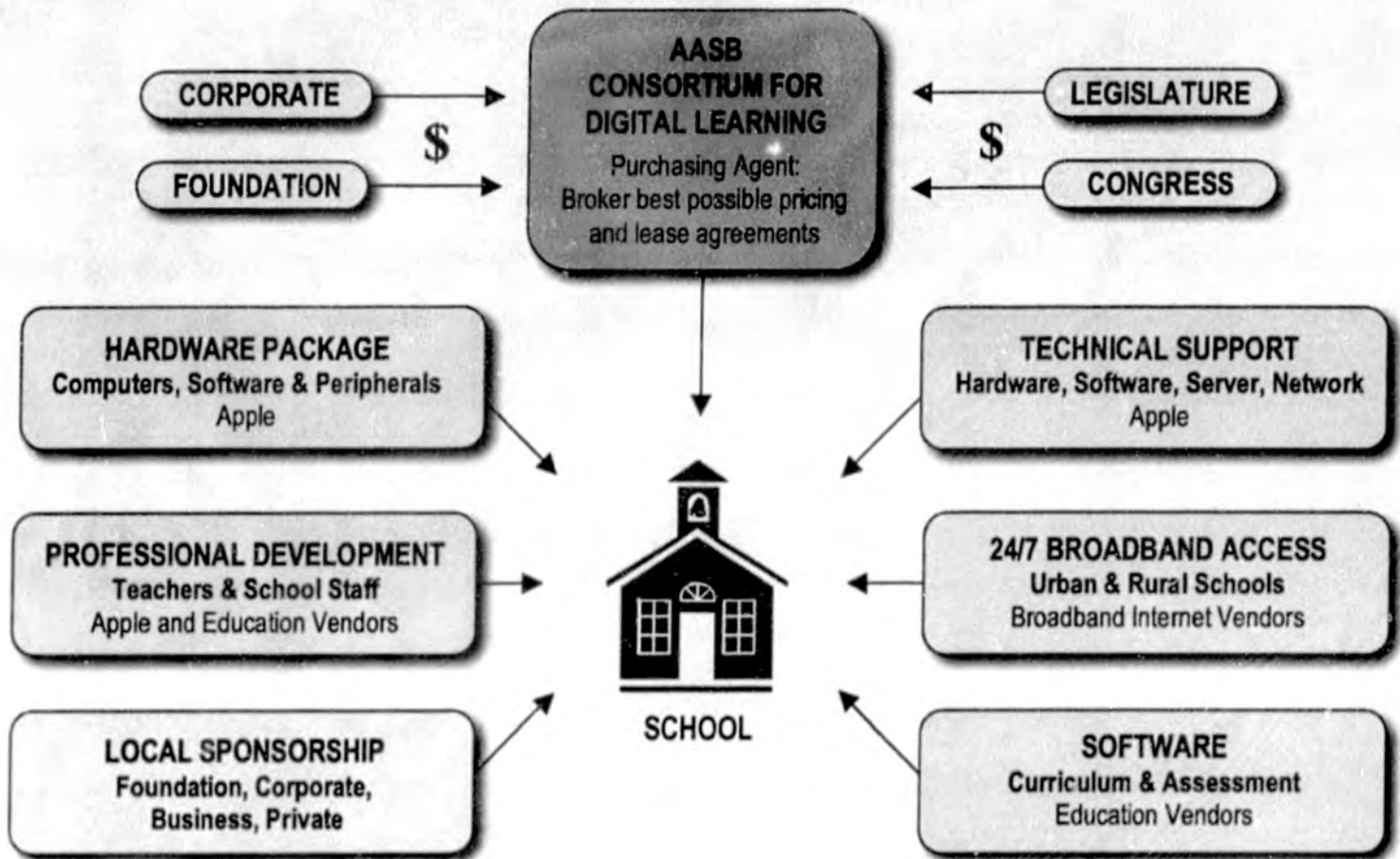
Presented by Carl Rose

Executive Director of the Association of Alaska School Boards

**** Meetings will be teleconferenced ****

Committee hearings may be postponed to 5:30 p.m.
depending on length of floor session.

CONSORTIUM FOR DIGITAL LEARNING AN OVERVIEW



The Association of Alaska School Board's Consortium for Digital Learning

AASB is proposing an enhanced educational delivery system that will prepare Alaska's youth for the digital world. Using an inclusive approach, districts and schools will be supported in:

- Determining readiness levels
- Engaging their community
- Securing hardware, software, and peripherals
- Acquiring necessary technical support for a fully functional system
- Training staff
- Managing change

Many school districts have made significant strides in uses of technology. Rarely, however, has technology been instituted in a systematic fashion that will allow our youth to compete successfully in our increasing global economy. Through the digital learning consortium, AASB is proposing a holistic use of technology that will change the basic approach to K-12 education.

The Road to the Digital School



Entry

Adoption

Adaptation

Appropriation

Innovation



Digital School

Leadership

Leadership Unclear

Leadership is delegated with little evaluation.

Little vision

No improvement plans

High aversion to risk

Leadership trying to establish itself

Top down leadership

Recognize vision in other districts

Asking for assistance

Open to new approaches

Clear leadership

Many stakeholders engaged

Creating a vision

Creating a plan

Allows new ideas

Credible, articulate leadership

Shared Leadership

Clear vision and goals

Stakeholders can articulate plan and their role in it

Encourage innovation

Leadership seen as visionary by peers

District or school seen as model for effective shared leadership

Demonstrated vision

Commitment to excellence

Innovation is part of culture

Learning

Print materials only

No Professional Development (PD) planning

Out-dated teaching methods

Little or no use of technology

Standardized tests only measure of achievement

Basic C&I - drill and practice

Some PD

Exploring new teaching methodologies

Know that technology can help

Weak connection between assessment and learning

Use of technology for higher order thinking

PD aligned to learning goals

Implementing new teaching methodologies

Pockets of excellence teaching with technology

Clear connection between assessment and learning

Use of digital authoring for teaching and learning

Comprehensive PD plan

Project based learning is evident throughout the institution

Use of technology for learning is pervasive

Integrated authentic assessment

24/7 access to digital content and tools for learning

PD supports and is validated by student learning

C&I is model for other districts

Technology supports the complete learning environment

Multiple assessments inform instruction

Infrastructure

Network unreliable, slow

No teachers have computers

Labs and/or limited classroom computers

Network limited to administration

Grading done on paper

School has a reliable network

Many teachers have their own computers

Some classroom computers

Teachers have access to the network

Teacher administrative tasks done with computers

High bandwidth network

Teachers have notebooks and productivity tools

Computers in all classrooms

Understand that mobility and wireless are in the future

Resources dedicated to application and internet support

High bandwidth out to the classrooms (some wireless)

Network and web-based teacher tools

Mobile carts deployed

Realize mobility and wireless are possible now

Fast, responsive support system in place for break fix

24/7 Access available to teachers and students

Web-apps support learning

All students have a dedicated laptop

Pervasive wireless access

Replacement policy in place for existing systems

Community

Disengaged parent community

Divisive Board

Negative press

Special interest groups in control

New ideas have much difficulty

Community without vision but receptive to new ideas

Board has low communication

Positive and Negative press

Special interest groups not controlled

New ideas tolerated but not embraced

Parents engaged and involved in planning

Supportive Board

Reactive PR

Majority supportive

Open to new ideas, but unclear on what to do

Community understands and supports vision

Policy making Board

Proactive PR

Strong sponsors in community

Clear link between vision and school improvement

Community is seen as a model

Board seen as visionary by peers

Comprehensive community outreach

Pervasive community support

Innovation becomes part of larger community culture

**Rising Above The Gathering Storm:
Energizing and Employing America for a Brighter Economic Future**

Statement of

Norman R. Augustine
Retired Chairman and Chief Executive Officer
Lockheed Martin Corporation

And

Chair, Committee on Prospering in the Global Economy of the 21st Century
Committee on Science, Engineering, and Public Policy
Division on Policy and Global Affairs
The National Academies

before the

Committee on Science
U.S. House of Representatives

October 20, 2005

Mr. Chairman and members of the Committee.

Thank you for this opportunity to appear before you on behalf of the National Academies' Committee on Prospering in the Global Economy of the 21st Century. As you know, our effort was sponsored by the National Academy of Sciences, National Academy of Engineering and Institute of Medicine (collectively known as the National Academies). The National Academies were chartered by Congress in 1863 to advise the government on matters of science and technology.

The Academies were requested by Senator Alexander and Senator Jeff Bingaman, members of the Senate Committee on Energy and Natural Resources to conduct an assessment of America's ability to compete and prosper in the 21st century—and to propose appropriate actions to enhance the likelihood of success in that endeavor. This request was endorsed by Representatives Sherwood Boehlert and Bart Gordon of the House Committee on Science.

To respond to that request the Academies assembled twenty individuals with diverse backgrounds, including university presidents, CEOs, Nobel Laureates and former presidential appointees. The result of our committee's work was examined by over forty highly qualified reviewers who were also designated by the Academies. In undertaking our assignment we considered the results of a number of prior studies which were conducted on various aspects of America's future prosperity. We also gathered sixty subject-matter experts with whom we consulted for a weekend here in Washington and who provided recommendations related to their fields of specialty.

It is the unanimous view of our committee that America today faces a serious and intensifying challenge with regard to its future competitiveness and standard of living. Further, we appear to be on a losing path. We are here today hoping both to elevate the nation's awareness of this developing situation and to propose constructive solutions.

The thrust of our findings is straightforward. The standard of living of Americans in the years ahead will depend to a very large degree on the quality of the jobs that they are able to hold. Without quality jobs our citizens will not have

the purchasing power to support the standard of living which they seek, and to which many have become accustomed; tax revenues will not be generated to provide for strong national security and healthcare; and the lack of a vibrant domestic consumer market will provide a *disincentive* for either U.S. or foreign companies to invest in jobs in America.

What has brought about the current situation? The answer is that the prosperity equation has a new ingredient, an ingredient that some have referred to as "The Death of Distance". In the last century, breakthroughs in aviation created the opportunity to move people and goods rapidly and efficiently over very great distances. Bill Gates has referred to aviation as the "World Wide Web of the twentieth century". In the early part of the present century, we are approaching the point where the communication, storage and processing of information are nearly free. That is, we can now move not only physical items efficiently over great distances, we can also transport *information* in large volumes and at little cost.

The consequences of these developments are profound. Soon, only those jobs that require near-physical contact among the parties to a transaction will not be opened for competition from job seekers around the world. Further, with the end of the Cold War and the evaporation of many of the political barriers that previously existed throughout the world, nearly three *billion* new, highly motivated, often well educated, new capitalists entered the job market.

Suddenly, Americans find themselves in competition for their jobs not just with their neighbors but with individuals around the world. The impact of this was initially felt in manufacturing, but soon extended to the development of software and the conduct of design activities. Next to be affected were administrative and support services. Today, "high end" jobs, such as professional services, research and management, are impacted. In short, few jobs seem "safe":

- U.S. companies each morning receive software that was written in India overnight in time to be tested in the U.S. and returned to India for further production that same evening—making the 24-hour workday a practicality.
- Back-offices of U.S. firms operate in such places as Costa Rica, Ireland and Switzerland.
- Drawings for American architectural firms are produced in Brazil.
- U.S. firm's call centers are based in India—where employees are now being taught to speak with a mid-western accent.
- U.S. hospitals have x-rays and CAT scans read by radiologists in Australia and India.
- At some McDonald's drive-in windows orders are transmitted to a processing center a thousand miles away (currently in the U.S.), where they are processed and returned to the worker who actually prepares the order.
- Accounting firms in the U.S. have clients tax returns prepared by experts in India.
- Visitors to an office not far from the White House are greeted by a receptionist on a flat screen display who controls access to the building and arranges contacts—she is in Pakistan.
- Surgeons sit on the opposite side of the operating room and control robots which perform the procedures. It is not a huge leap of imagination to have highly-specialized, world-class surgeons located not just across the operating room but across the ocean.

As Tom Friedman concluded in *The World is Flat*, globalization has "accidentally made Beijing, Bangalore and Bethesda next door neighbors". And the neighborhood is one wherein candidates for many jobs which currently reside in the U.S. are now just a "mouse-click" away.

How will America compete in this rough and tumble global environment that is approaching faster than many had expected? The answer appears to be, "not very well"—unless we do a number of things differently from the way we have been doing them in the past.

Why do we reach this conclusion? One need only examine the principal ingredients of competitiveness to discern that not only is the world flat, but in fact it may be tipping *against* us.

One major element of competitiveness is, of course, the cost of labor. I recently traveled to Vietnam, where the wage rate for low-skilled workers is about twenty-five cents per hour, about one-twentieth of the U.S. minimum wage. And the problem is not confined to the so-called "lower-end" of the employment spectrum. For example, five qualified chemists can be hired in India for the cost of just one in America. Given such enormous disadvantages in labor cost, we cannot be satisfied merely to match other economies in those other areas where we do enjoy strength; rather we must excel . . . markedly.

The existence of a vibrant domestic market for products and services is another important factor in determining our nation's competitiveness, since such a market helps attract business to our shores. But here, too, there are warning signs: Goldman Sachs analysts project that within about a decade, fully 80% of the world's *middle-income* consumers will live in nations outside the currently industrialized world.

The availability of financial capital has in the past represented a significant competitive advantage for America. But the mobility of financial capital is legion, as evidenced by the willingness of U.S. firms to move factories to Mexico, Vietnam and China if a competitive advantage can be derived by doing so. Capital, as we have observed, crosses geopolitical borders at the speed of light.

Human capital—the quality of our work force—is a particularly important factor in our competitiveness. Our public school system comprises the foundation of this asset. But as it exists today, that system compares, in the aggregate, abysmally with those of other developed—and even developing—nations . . . particularly in the fields which underpin most innovation: science, mathematics and technology.

Of the utmost importance to competitiveness is the availability of knowledge capital—"ideas". And once again, scientific research and engineering applications are crucial. But knowledge capital, like financial capital, is highly mobile. There *is* one major difference: being first-to-market, by virtue of access to new knowledge, can be immensely valuable, even if by only a few months. Craig Barrett, a member of our committee and Chairman of Intel, points out that ninety percent of the products his company delivers on December 31st did not even exist on January 1st of that same year. Such is the dependence of hi-tech firms on being at the leading edge of scientific and technological progress.

There are of course many other factors influencing our nation's competitiveness. These include patent processes, tax policy and overhead costs—such as healthcare, regulation and litigation—all of which tend to work against us today. On the other hand, America's version of the Free Enterprise System has proven to be a powerful asset, with its inherent aggressiveness and discipline in introducing new ideas and flushing out the obsolescent. But others have now recognized these virtues and are seeking to emulate our system.

But is it not a *good* thing that others are prospering? Our committee's answer to that question is a resounding "yes". Broadly based prosperity can make the world more stable and safer for all; it can make less costly products available

for American consumers; it can provide new customers for the products we produce here. Yet it is inevitable that there will be relative winners and relative losers—and as the world prospers, we should seek to assure that America does not fall behind in the race.

The enigma is that in spite of all these factors, America seems to be doing quite well just now. Our nation has the highest R&D investment intensity in the world. We have indisputably the finest research universities in the world. California alone has more venture capital than any nation in the world other than the United States. Two million jobs were created in America in the past year alone, and citizens of other nations continue to invest their savings in America at a remarkable rate. Total household net worth is now approaching \$50 *trillion*.

The reason for this prosperity is that we are reaping the benefits of past investments—many of them in the fields of science and technology. But the early indicators of future prosperity are generally heading in the wrong direction. Consider the following:

- For the cost of one engineer in the United States, a company can hire eleven in India.
- America has been depending heavily on foreign-born talent. Thirty-eight percent of the scientists and engineers in America holding doctorates were born abroad. Yet, when asked in the spring of 2005, what are the most attractive places in the world in which to live, respondents in only one of the countries polled indicated the U.S.A.
- Chemical companies closed seventy facilities in the U.S. in 2004, and have tagged forty more for shutdown. Of 120 *new* chemical plants being built around the world with price tags of \$1 billion or more, one is in the U.S. Fifty are in China.
- In 1997 China had fewer than fifty research centers managed by multinational corporations. By 2004 there were over six-hundred.
- Two years from now, for the first time, the most capable high-energy particle accelerator on earth will reside outside the United States.
- The United States today is a net importer of *high technology* products. The U.S. share of global high tech exports has fallen in the last two decades from 30% to 17%, while America's trade balance in high tech manufactured goods shifted from a *positive* \$33B in 1990 to a *negative* \$24B in 2004.
- In a recent international test involving mathematical understanding, U.S. students finished in 27th place among the nations participating.
- About two-thirds of the students studying chemistry and physics in U.S. high schools are taught by teachers with no major or certificate in the subject. In the case of math taught in grades five through twelve, the fraction is one-half. Many such students are being taught math by graduates in physical education.
- In one recent period, low-wage employers like Wal-Mart (now the nation's largest employer) and McDonald's created 44% of all new jobs. High-wage employers created only 29%.
- In 2003 foreign students earned 59% of the engineering doctorates awarded in U.S. universities.
- In 2003 only three American companies ranked among the top ten recipients of patents granted by the U.S. Patent Office.

- In Germany, 36% of undergraduates receive their degrees in science and engineering. In China, the corresponding figure is 59%, and in Japan it is 66%. In the U.S., the share is 32%. In the case of engineering, the U.S. share is 5%, as compared with 50% in China.

- The United States is said to have over ten million illegal immigrants, but the number of legal visas set-aside annually for "highly qualified foreign workers" was recently dropped from 195,000 per year down to 65,000.

- At a time when the world's nations are clamoring to obtain science and engineering talent, U.S. law will grant a visa for outstanding foreign students to attend U.S. universities only if they promise they will go home when they graduate.

- In 2001 (the most recent year for which data are available), U.S. industry spent more on tort litigation and related costs than on research and development.

As important as jobs are, the impact of these circumstances on our nation's security could be even more profound. In the view of the bipartisan Hart-Rudman Commission on National Security, "... the inadequacies of our system 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."

The good news is that there are things we can do to assure that America does in fact share in the prosperity that science and technology are bringing the world. In this regard, our committee has made four broad recommendations as the basis of a prosperity initiative—and offers 20 specific actions to make these recommendations a reality. They include:

o **"Ten Thousand Teachers, Ten Million Minds"—which addresses America's K-12 education system. We recommend that America's talent pool in science, math and technology be increased by vastly improving K-12 education. Among the specific steps we propose are:**

- Recruitment of 10,000 new science and math teachers each year through the award of competitive scholarships in math, science and engineering that lead to a bachelor's degree accompanied by a *teaching certificate*—and a 5-year commitment to teach in a public school.

- Strengthening the skills of 250,000 current teachers through funded training and education in part-time master's programs, summer institutes and Advanced Placement training programs.

- Increasing the number of students who take Advanced Placement science and mathematics courses.

o **"Sowing the Seeds"—which addresses America's research base. We recommend strengthening the nation's traditional commitment to long-term basic research through:**

- Increasing federal investment in research by 10% per year over the next seven years, with primary attention devoted to the physical sciences, engineering, mathematics, and information sciences—without *disinvesting* in the health and biological sciences.

- Providing research grants to early career researchers

- Instituting a National Coordination Office for Research Infrastructure to oversee the investment of an additional \$500M per year for five years for advanced research facilities and equipment.

- Allocating at least 8% of the existing budgets of federal research agencies to discretionary funding under the control of local laboratory directors.

- Creation of an Advanced Research Projects Agency—Energy (ARPA-E), modeled after DARPA in the Department of Defense, reporting to the Department of Energy Undersecretary for Science. The purpose is to support the conduct of out-of-the-box, transformational, generic, energy research by universities, industry and government laboratories.

- Establish a Presidential Innovation Award to recognize and stimulate scientific and engineering advances in the national interest.

o **“Best and Brightest”—which addresses higher education. In this area we recommend:**

- Establishing 25,000 competitive science, mathematics, engineering, and technology undergraduate scholarships and 5,000 graduate fellowships in areas of national need for US citizens pursuing study at US universities.

- Providing a federal tax credit to employers to encourage their support of continuing education.

- Providing a one-year automatic visa extension to international students who receive a science or engineering doctorate at a U.S. university, and providing automatic work permits and expedited residence status if these students are offered employment in the US.

- Instituting a skill-based, preferential immigration option

- Reforming the current system of “deemed exports” so that international students and researchers have access to necessary non-classified information or research equipment while studying and working in the US.

o **“Incentives for Innovation”—in which we address the innovation environment itself. We recommend:**

- Enhancements to intellectual property protection, such as the adoption of a first-to-file system.

- Increasing the R&D tax credit from the current 20% to 40%, and making the credit permanent.

- Providing permanent tax incentives for US-based innovation so that the United States is one of the most attractive places in the world for long-term innovation-related investments.

- Ensuring ubiquitous broadband Internet access to enable U.S. firms and researchers to operate at the state of the art in this important technology.

It should be noted that we are not confronting a so-called “typical” crisis, in the sense that there is no 9/11, Sputnik or Pearl Harbor to alert us as a nation. Our situation is more akin to that of the proverbial frog being slowly boiled. Nonetheless, while our committee believes the problem we confront is both real and serious, the good news is that we may well have time to do something about it—if we start now.

Americans, with only 5% of the world’s population but with nearly 30% of the world’s wealth, tend to believe that scientific and technological leadership and the high standard of living it underpins is somehow the natural state of affairs. But such good fortune is *not* a birthright. If we wish our children and grandchildren to enjoy the standard of living most Americans have come to expect, there is only one answer: We must get out and *compete*.

I would like to close my remarks with a perceptive and very relevant poem. It was written by Richard Hodgetts, and eloquently summarizes the essence of innovation in the highly competitive, global environment. The poem goes as follows:

*Every morning in Africa a gazelle wakes up.
It knows it must outrun the fastest lion or it will be killed.*

*Every morning in Africa a lion wakes up.
It knows it must outrun the slowest gazelle or it will starve.*

*It doesn't matter whether you're a lion or a gazelle –
when the sun comes up, you'd better be running.*

And indeed we should.

Thank you for providing me with this opportunity to testify before the committee. I would be pleased to answer any questions you have about the report.



The Progress of Education Reform 2006

Technology in Education

Vol. 6, No. 6, January 2006

What's Inside

- The impact of one-to-one computing on teaching and learning
- Lessons learned from large-scale student-laptop programs
- Just over the horizon, "digital learning spaces"

States, Districts Beginning to Tap the Potential of Technology-Enhanced Learning

A small but growing number of states – and dozens of school districts across the nation – are supporting programs that provide laptop computers and wireless Internet access to all students and teachers in particular grades or particular schools. Such initiatives aim to enhance educational achievement and opportunity by:

- Transforming classrooms into more engaging, collaborative and productive learning environments in which instruction can be customized to students' specific needs, interests and learning styles
- Improving students' preparation for living, working and learning in a rapidly changing, information-driven world
- Reducing the "digital divide" between students who have access to technology at home and those who don't.

In launching Maine's pioneering student laptop program in 2002, then Governor Angus King said: "In my 30 years of working on economic development issues, no idea has as much potential for leapfrogging other states and putting Maine in a position of national leadership as this one – giving our students portable, Internet-ready computers as a basic tool for learning."

In Maine, all 7th and 8th graders – and a growing proportion of high school students – now have laptops and wireless Internet access. "One-to-one computing" initiatives (in which each student has his/her own personal computer in the classroom) also are under way or being piloted in Connecticut, the District of Columbia, Indiana, Massachusetts, Michigan, New Hampshire, New Mexico, Texas and Vermont – as well as districts ranging from Broward County in Florida, the nation's sixth-largest school system, to tiny Denali Borough School District in Alaska.

(Continued on next page)



(Continued from page 1)

For policymakers, educators and others interested in learning more about the one-to-one computing movement, this issue of *The Progress of Education Reform* spotlights three particularly useful resources:

- A detailed review of the challenges faced by states and districts implementing laptop programs, and of lessons learned to date in five critical areas: planning, training and professional development, hardware and software, managing change, and program monitoring and evaluation
- A recently published study of the use and impact of one-to-one computing in the Henrico County School District in Virginia, where all students and teachers in grades 6-12 have laptops with wireless Internet connectivity
- A report by the Consortium for School Networking examining how new and emerging technologies could reshape teaching and learning in K-12 schools over the next five years.

Lessons Learned About Providing Laptops for All Students

(Northeast and the Islands Regional Technology in Education Consortium, 2004, <http://www.neirtec.org/laptop>)

Drawing on various sources – program evaluations, articles, reports and interviews with policymakers – this 14-page paper summarizes the lessons learned to date from state- and district-supported laptop initiatives.

Authors Andrew Zucker and Alejandra Bonifaz begin with a brief review of the issues, challenges and setbacks that states and districts implementing laptop programs have grappled with, ranging from unexpected costs and technical difficulties to controversy over students being allowed to take laptops home.

The success of such initiatives, the authors conclude, hinges on policymakers giving close, sustained attention to – and making strategic investments in – five critical areas: planning, training and professional development, hardware and software, managing change, and program monitoring and evaluation.

The paper provides a look at various policy options, funding approaches and implementation strategies in each of the five areas, as well as links to additional sources of information.



A Study of One-to-One Computer Use in Mathematics and Science Instruction at the Secondary Level in Henrico County Public Schools

(SRI International and Education Development Center Inc., February 2005,

<http://ubiqcomputing.org/FinalReport.pdf>)

In 2002, Henrico County Public Schools, in suburban Richmond, Virginia, became the largest district in the nation to implement one-to-one computing in its middle and high schools. In addition to distributing laptop computers to more than 25,000 students and teachers, the district established wireless local area networks, invested in new hardware and software, and provided a range of training and professional development opportunities for teachers.

This National Science Foundation study – which involved extensive classroom observation, interviews and surveys, case studies and data analysis – focused on the overall impact of the laptop initiative on students, teachers and families, and its particular impact on math and science instruction in the district's high schools.

The study found computers being used extensively by Henrico County students and teachers – in various settings and for multiple purposes, and in all subjects, ranging from physical education to foreign languages. Zeroing in on high school science and math classrooms, the study team found students routinely using computers for note-taking, research, homework assignments, test preparation, and for storing, organizing and retrieving information. Taking advantage of a variety of software packages and online resources, science students could participate in a "virtual dissection," track a hurricane or an asteroid, choose from among hundreds of "virtual field trips" and WebQuests (online learning tools), design and analyze experiments, and create Web sites, iMovies and slide shows. Math students were making regular use of graphing calculators, spreadsheets, drawing programs and a variety of analytical tools and online resources.

Students, teachers, administrators and parents alike, the study found, saw one-to-one computing as having "positively influenced teaching and learning," including:

- Improvements in teacher productivity, student-teacher interaction and communication between parents and teachers
- Easier access by teachers and students to up-to-date instructional content
- A more dynamic and engaging classroom environment. Students reported feeling better organized and motivated, more technologically proficient and increasingly adept at self-directed learning.

The report concludes with a look at the factors that have contributed to the initiative's success – chief among them, the strong and steady support of students, families and teachers – and those that have served to impede progress. It also identifies emerging issues and challenges, such as managing the transition from textbooks to electronic learning, and developing better tools for measuring the impact of one-to-one computing on student achievement.

Other Resources

Nine states are in the final year of a federally funded \$15 million research project designed to identify, develop and share better ways of assessing the impact of technology on student achievement. States are using their grants, for example, to evaluate and improve the effectiveness of teacher technology training and professional development (Iowa), middle school laptop computer programs (Texas), virtual foreign language courses (West Virginia) and project-based learning (Arkansas). All nine states – the others are Maine, North Carolina, Pennsylvania, Tennessee and Wisconsin – are working with partners, including universities, school districts and research firms.

Additional information on the research project is available at <http://www.ed.gov/news/pressreleases/2003/11/11102003.html>.

The following Web sites are useful sources of information about technology-mediated learning, one-to-one computing in schools and the progress of state- and district-supported laptop initiatives.

Ubiquitous Computing Evaluation Initiative

<http://ubiqcomputing.org/>

Learning With Laptops

<http://www.learningwithlaptops.org/>

Learning Point Associates

<http://www.learningpt.org/page.php?pageID=81>

Center for Applied Research in Educational Technology

<http://caret.iste.org/>



Digital Learning Spaces 2010

(Consortium for School Networking, September 2005. An executive summary is available at http://www.cosn.org/resources/emerging_technologies/learningspaces.cfm, along with information on ordering a copy of the full report.)

New and emerging technologies have the potential to transform public education on a grand scale within five years, according to this report by the Consortium for School Networking. Just over the horizon, it says, are "technology-intensive learning environments" supported by:

- Broadband, wide-arc networks capable of handling data, voice and video traffic
- Local area networks with wired and wireless connectivity at every site
- Extensive use of laptops, portable devices, digital accessories, software and Web services that facilitate both customized and shared learning.

What will emerge, the report says, is a new model of education in which students do a substantial amount of work outside the school building – online, in the "outdoor classroom," and in peer-to-peer or small-group networks – and can be grouped according to their areas of interest, regardless of their age, grade level or geographic location, to pursue topics that cut across disciplines. It's also a model that reshapes and expands the role of the teacher – from being the sole source of information to being a guide, mentor and coach in the learning process.

The report addresses how education policymakers can begin building the public vision and add capacity to create "richer, more customized learning spaces for students and teachers by the end of the decade," and includes specific recommendations on connectivity systems and hardware.

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GE Fund

**Helping State Leaders
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ASSOCIATION OF ALASKA SCHOOL BOARDS

Advocates for Alaska's Youth

PROPOSAL

CONSORTIUM FOR DIGITAL LEARNING

Overview

The Association for Alaska School Boards (AASB) is seeking funding for the creation of a Consortium for Digital Learning to provide the opportunity for Alaskan students to raise academic achievement, compete in a world economy, and enjoy an enhanced quality of life through access to a 1:1 digital learning environment.

AASB Commitment to Quality Education

For over 50 years AASB has been an advocate for children and youth by assisting school boards in providing quality public education focused on student achievement through effective local governance. In recent years the addition of AASB's Initiative for Community Engagement (Alaska ICE) and Quality Schools / Quality Students (QS2) program have complimented this mission.

Recognizing the interdependence of student achievement and family and community support, AASB formed supportive partnerships with school districts to help all students achieve at the highest academic levels possible. In addition to school improvement efforts, intensive community engagement has also been undertaken to encourage greater involvement of parents and other adult mentors with young people to help them succeed in school, and in life.

This holistic approach to education, our credibility and influence with both school districts and state level policy makers, and our firm commitment to making children Alaska's top priority, uniquely positions AASB to implement a logical next step: assisting Alaska schools in being even more relevant to students through the creation of Digital Learning Environments.

Computers and the Internet have changed the way we work, communicate and collaborate. Young adults entering nearly any field in today's work force will be required to possess technology skills. A growing body of evidence suggests that many jobs are migrating out of the U.S. due to the growing technology proficiency in other countries. Access to a digital learning environment will help prepare Alaska's students to succeed in an increasingly competitive global economy.

Consortium Structure

Membership in the consortium would be available to all public education K-12 programs supported by Foundation Funding, which includes 53 Alaska school districts, Mt. Edgecumbe High School and the ChalleNGe Program.

The Association of Alaska School Boards will administer all facets of the consortium, including public advocacy, communication with consortium leaders, fiduciary responsibility for receipt, distribution and accountability of all state and federal funds, and brokering technology-related services and equipment to consortium members.

An advisory council will be created to oversee the consortium. Duties of appointees will include the selection of consortium funding recipients, review of financial accounting by AASB, technology expertise, and professional education and administration mentoring.

Funding

AASB is pursuing \$5 million in state funding to create a Consortium for Digital Learning that facilitates the implementation of Digital Learning Environments in Alaska school districts this year. Some Alaska schools have already made a commitment to Digital Learning Environments and are reporting significant academic improvement. We envision an investment of \$5 million in state funds, combined with matching local and federal funds, bringing \$15 million to this initiative. With these funds we can begin to systemically improve the \$900 million face of Alaska education.

Meeting the education needs of an entire state is a daunting task, but this relatively small investment is an important step toward a solution. Our world has quickly become a decentralized, digital work environment. These rapid global changes have created a tipping point. We need to position ourselves to capitalize on these changes so our kids will have every advantage we can give them to succeed in this new "flat world" economy they will soon inherit.

A combined local, state and federal investment of \$15 million can ignite a vision that will quite literally change the emphasis of our entire state K-12 education system. The creation of Digital Learning Environments in Alaska schools will help our students to unleash their tremendous potential, raise achievement levels, and prepare them to arrive in the workplace well-versed in relevant employment skills.

Requirements for Funding Assistance

Participating school districts will need to exhibit a level of readiness, willingness, and firm commitment to the success of this initiative. Any Alaska school district may apply for funding assistance to implement Digital Learning Environments in their schools. Applicant districts meeting the requirements will be required to submit an implementation plan to the consortium for consideration, which will include:

- A statement of the district's needs, readiness, commitment and vision for digital learning.
- Concise goals for teaching and learning.
- Communications plan to generate digital learning support in the community.
- Implementation plan addressing all aspects of a Digital Learning Environment rollout, including policy guidelines, professional development, staffing, curriculum adjustments, strategic implementation (grades/schools/district-wide), reallocation of existing district funds, voc-tech training for in-district maintenance and technical support, timelines, assessment and sustainability.
- Cost breakdowns for hardware (leasing/purchase plan), connectivity, professional development and technical support/maintenance.

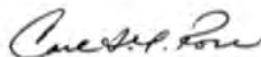
Conclusion

All aspects of AASB's mission revolve around helping Alaska's kids succeed. We take the job seriously because our membership consists of more than 330 individual board members, responsible for 100 percent of the students who attend Alaska's public schools.

AASB is experienced in working with school board members and state policy makers, forming successful partnerships with diverse statewide organizations, and managing multi-million dollar grant funds. AASB's experience in collaboration and our credibility in launching and sustaining successful initiatives has been validated by Apple Computers' willingness to join forces to promote Digital Learning Environments in Alaska's schools.

Thank you for considering this funding request. If you have questions or need clarification, please do not hesitate to contact me.

Sincerely,



Carl Rose, Executive Director
Association of Alaska School Boards

Creating a Digital Learning Consortium for Alaska

Carl Rose
Executive Director
Association of Alaska School Boards

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Make it Happen



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Keep in Mind . . .

- Class of 2017
- Children Achieving Their Dreams –
The Children We Have.....
- Success to Significance

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“There is nothing permanent
except change.”

~Heraclitus
535 BCE to 475 BCE

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"Given a choice between changing and proving that it is not necessary to change, most people get busy on the proof."

~J.K. Galbraith

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At the same time, the secret of growth and development is learning how to contend with the forces of change. Change is about possibility.

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Epidemic of Immediacy

- Urgency
- So Much To Be Done, So Little Time
- Future Shock - Alvin Toffler

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PREDICTIONS

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**Prediction is difficult, especially
when it involves the future.**

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REALLY BAD PREDICTIONS

"Law will be simplified. . . Lawyers will
have diminished, and their fees will
have been vastly curtailed."

Journalist Junius Henri Browne, 1893

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REALLY BAD PREDICTIONS

"Before man reaches the moon your mail will be
delivered within hours from New York to
Australia by guided missiles. We stand on the
threshold of rocket mail."

Arthur Summerfield, US Postmaster General under Eisenhower, 1959.

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Challenges

- Globalization

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Globalization

- 9/11
- 11/9
- 8/9
- Dot Com Boom
- Dot Com Bust

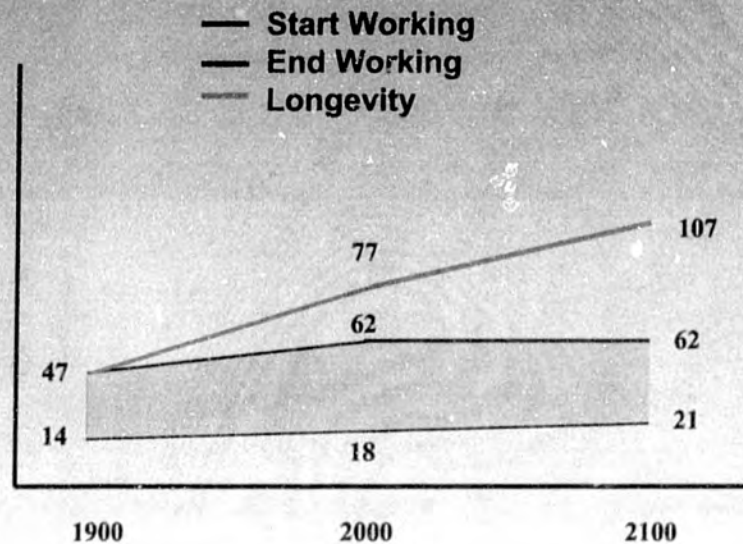
Globalization

- Tax Returns
- MRIs
- Reuters

- 16th Spain
- 17th Netherlands
- 18th France
- 19th Britain
- 20th USA
- 21st ???—no one country will ever again be the dominant focus of the entire century.

Challenges

- Globalization
- **Demographics**



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2000 Population

	19 ↓	55 ↑
U.S.	28.3 %	21.0 %
India	43.7 %	12.2 %

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Registered Voters School Age Children

- 1960 50 %
- 2005 18 %

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Challenges

- Globalization
- Demographics
- **Values / Beliefs**

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Larger Context

- 1901 – 24 G.I.
- 1925 – 42 Silent
- 1943 – 60 Boomers
- 1961 – 81 Gen X
- 1982 - Millennial

Percent Minority

- G.I. 14.3 %
- Silent 19.9 %
- Boomers 25.5 %
- Gen X 36.2 %
- Millennial 40.3 %

Millennial Parents

- Accountability
- Protective
- Connected 24 / 7
- Cool to be Smart
- Team Skills
- Cool to Know Technology

HIGH SCHOOL SWEETHEARTS in "THE BIG STEP"



1950

HIGH SCHOOL SWEETHEARTS IN "THE BIG STEP"

LET'S GET
MARRIED
FIRST



1950

LET'S GET
STONED
FIRST



1970

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Source: Neil Howe - Life Course Associates

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HIGH SCHOOL SWEETHEARTS IN "THE BIG STEP"

LET'S GET
MARRIED
FIRST



1950

LET'S GET
STONED
FIRST



1970

LET'S GET
TESTED
FIRST



1990

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Source: Neil Howe - Life Course Associates

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'YOU GET FIVE MINUTES BETWEEN SOCCER AND PIANO?
WHAT DO YOU DO WITH ALL THAT FREE TIME?!?'

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Source: Neil Howe - Life Course Associates

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Challenges

- Globalization
- Demographics
- Values / Beliefs
- Technology

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Information Technology

- Processing
- Communications

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1964 IBM System / 360 Mainframe



Central Units' Memory = 8 MB

2004 iPod = 4 GB

2005 iPod = 20-80 GB

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Bio Technology

- Biological Science
- Practical Application

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Bio-Info

- Cell → Hardware
- DNA → Software

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Fundamental Challenge

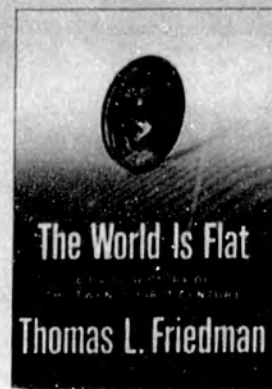
Changing the expectations of educators, parents, community members and students regarding what is possible.

Refer to slide 6

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Our World Has Changed



Rapid Global Changes Have Created a Tipping Point

- Computers and the Internet have changed the way we work, communicate and collaborate.
- The new work environment is Digital and Decentralized:
 - Commerce is web-based
 - Economies are global
 - Technology proficiency is essential

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Our World Has Changed

Competitive Global Economy



- American jobs are moving to India, China, Russia and other countries.
- Alaska students will be competing for jobs against a global workforce that is well-educated and technology trained.
- Our students need every advantage we can provide to help them succeed in this new "flat world" economy.

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Our Education System Must Adapt



Approach Education Differently

- **New Education Equation:** A quality public school education will produce a workforce ready to compete in the global economy.
- Systemic changes to the Alaska education system are necessary to achieve this goal.
- Rather than simply "teaching technology," the technology should be used to teach the curriculum more effectively, in ways today's students learn.

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Digital Learning Environments in Schools

Effective Ways to Teach and Learn



Classroom Components:

- 1 to 1 laptop computer learning environments
- Digitally delivered instructional curriculum
- 24/7 wireless broadband Internet network
- Server space for student portfolios
- Professional development

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Results Nationally Significant Academic Gains



American schools with digital learning environments are seeing improvements throughout their student populations:

- More time on task
- Higher levels of comprehension
- Greater pride in their work
- Higher test scores
- Decreased absentee, dropout rates
- More students continuing to college

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Results in Alaska Student Achievement Increased



Denali School District rolled out Alaska's first 1 to 1 laptop initiative 3 years ago. The results are promising:

- Better student engagement, specifically among those with special needs or economic disadvantages.
- Steady improvement in AYP scores.
- All grades consistently performing above statewide averages in math, reading and writing.
- More parent involvement.

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Creating a Consortium for Digital Learning Making Kids Alaska's Top Priority



AASB is proposing a consortium of the State of Alaska, the federal government and school districts across the state to help students:

- Enjoy an enhanced quality of education through access to digital learning environments.
- Raise academic achievement levels.
- Unleash their tremendous potential.
- Arrive in the workplace well-versed in relevant employment skills.
- Successfully compete in a global economy.

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The Cost

Modest Investment, Important Step



\$5 million in state funds, combined with matching Local, federal funds, brings \$15 million to initiative.

- Provides incentives to create systemic changes in Alaska's \$900 million education system.
- Business, corporate funding will be pursued by AASB to help school districts offset costs.
- Alaska's students positioned to meet the challenges of an increasingly competitive world.

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The Time To Act Is Now

A concerted effort is needed to grow Digital Learning Environments in Alaska schools.



- We must prepare our young people for their digital future in a global economy.
- If students aren't taught necessary skills, their economic viability will be in question as they enter the workforce.
- A Digital Learning Consortium offers:
 - Improved student achievement.
 - Readies youth to take advantage of unrealized economic development opportunities in all regions of our state.

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The Time To Act Is Now



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