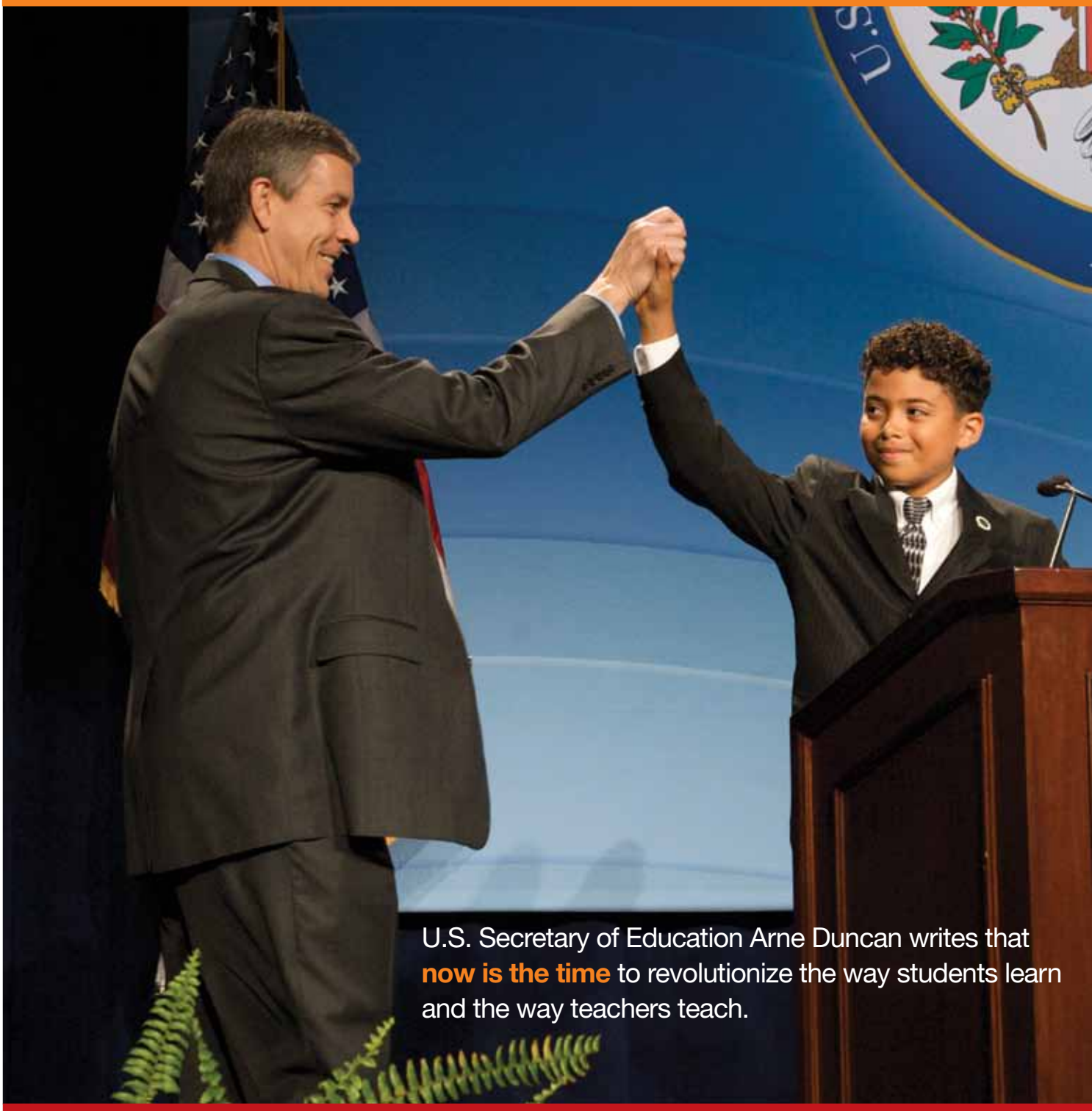
By Arne Duncan

Harness the Power of Technology



U.S. Secretary of Education Arne Duncan writes that **now is the time** to revolutionize the way students learn and the way teachers teach.

Duncan congratulates a student from a Blue Ribbon School at the Omni Shoreham Hotel in Washington, D.C.

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Now more than ever, schools need you. Research shows that students who benefit from both technology and effective teachers learn more than students who have one but not the other. Great teachers employ smart uses of technology to personalize the learning experience and engage students in the pursuit of the learning they need.

Today, U.S. educators are teaching in the midst of a technological revolution. Technology promises to provide innovative solutions in the nation's classrooms, just as it has transformed the way we communicate, socialize, and conduct business. Now it is time for us to harness technology to revolutionize the way students learn and the way teachers teach.

Innovative teachers like you are leading this technological transformation in our classrooms today. You use powerful resources to engage students, deepen their understanding, expand their creativity, and help them solve problems. Because you have the passion, knowledge, and experience, you can prepare your colleagues to follow your lead and play a pivotal role in our national effort to transform our schools into innovative learning environments.

I understand that you face considerable challenges as you create digital learning environments. Some schools are rich with technology but are still stuck in the 20th century model of teaching and learning. Some teachers still see technology as an add-on to their lesson plans rather than integral to the process of teaching and learning. Computer labs too often are testing factories that don't harness technology's potential to accelerate student achievement. Far too many schools—particularly those in rural areas—do not have access to broadband internet, which limits teachers' and students' abilities to leverage the productive value of technology to assist the learning process. Finally, for all the progress our schools have made, educators still don't have an organized and coherent understanding of the most effective and engaging uses of technology.

Technology Engages Students

It's essential that you work with your peers to overcome these obstacles. For starters, we know that technology has the power to engage. Students who are hesitant to read books may become interested when assignments from that reading send them to the internet for a scavenger hunt or to research ways to solve a character's problem. Much like the printing press allowed people to learn from books as well as teachers, digital technology offers learners powerful new environments that include simulations, animations, scaffolded and guided practice sets, and experts who may be far away. With your firsthand experiences, you are uniquely qualified to articulate, showcase, and explore the power of technologies for learning.

An exciting aspect of technology that I often hear about from teachers is its power to personalize learning experiences. Technology can pace instruction based on each student's needs, so that a student having trouble with a mathematical concept can get remediation at the same time that an advanced student moves on to higher concepts. Many emerging programs support learning, including videos, online tutoring networks, and adaptive programs. With the facilitation of an effective teacher, these innovations address students' specific learning needs and accelerate achievement. As leaders in your field, your role is to adapt and leverage technology to focus on solving learning problems.

ARPA-ED to Pursue Breakthroughs

To encourage the education sector to invest the necessary funds and speed up the pace of innovation of learning technologies, the U.S. Department of Education has proposed the establishment of the Advanced Research Projects Agency for Education, or ARPA-ED. Modeled on a similar agency in the U.S. Department of Defense that spurred the creation of technologies such as the internet and GPS, ARPA-ED will aggressively pursue technological breakthroughs that have similar potential to transform teaching and learning. ARPA-ED offers the opportunity to create an environment where teachers integrate technology into everything that happens in our nation's classrooms. It will move us away from our current structure, where technology is an isolated program that isn't part of students' daily learning experiences.

ISTE NETS Guide Tech Integration

No matter what funding or supports exist for technology, the truth of the matter is that teachers are still the most essential part of the learning process. Now more than ever, schools need you. Research shows that students who benefit from both technology *and* effective teachers learn more than students who have one but not the other. Great teachers employ smart uses of technology to personalize the learning experience and engage students in the pursuit of the learning they need.

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(Left) U.S. Education Secretary Arne Duncan and Bradley Haas, a program analyst in the Office of Postsecondary Education, help Jena Thompson, a fourth grader who goes to the Department of Education for a special tutoring program.

(Right) Duncan chats with a student at Jefferson Middle School in Washington, D.C. He visited the school to announce the release of *Net Cetera: Chatting with Kids About Being Online*, a booklet that serves as a guide for parents as they help children navigate the internet.

ISTE already has done important work creating the NETS, which define how teachers should integrate technology into the process of learning and teaching (iste.org/standards). By using the NETS for students, administrators, and teachers, you become the leaders in your schools and districts, working with colleagues to help them master new methods of teaching with technologies that they may be afraid of using. Your role is critical as you identify ways that you and your peers can take advantage of existing technologies in your classrooms today and identify emerging technologies that will enhance learning opportunities in the future. We need to continue to hear your voice so that local, state, and federal policy makers are making decisions based on the best information from experts in the classroom.

Five Goals to Advance Ed Tech

The U.S. Department of Education has a distinct role to play. We want to support your work with resources and leadership. We have a comprehensive and coordinated series of initiatives designed to improve access to technology and support its use in the classroom. Through the National Education Technology Plan, we have identified five goals for the federal government to advance the digital classroom.

Learning: Engage and Empower
All learners will have engaging and empowering learning experiences both in and out of school that prepare them to be active, creative, knowledgeable, and ethical participants in our globally networked society.

Assessment: Measure What Matters
At all levels, our education system will leverage the power of technology to measure what matters and use assessment data for continuous improvement.

Teaching: Prepare and Connect
Technology will support professional educators individually and in teams by connecting them to data, content, resources, expertise, and learning experiences that enable and inspire more effective teaching for all learners.

Infrastructure: Access and Enable
All students and educators will have access to a comprehensive infrastructure for learning when and where they need it.

Productivity: Redesign and Transform
Our education system will redesign processes and structures at all levels to take advantage of the power of technology to improve learning outcomes while making more efficient use of time, money, and staff.

Our policies address three specific needs that are critical to advancing technology in the classroom.

We are supporting states as they raise their standards to reflect the knowledge and skills that will be necessary to succeed in the 21st century. These standards will give technology educators a clear road map for designing the creative, engaging, and powerful technology-based learning tools that will prepare students for success in college and careers. To build assessments aligned with these new standards, the Education Department has awarded $350 million to states to create assessments that will measure students' progress on the full range of standards aligned with college and career expectations. These assessments will go beyond the end-of-course standardized bubble tests that are common across the country today. They will use computer adaptive technologies and challenge students to analyze and solve complex problems, communicate clearly, synthesize information, apply knowledge, and generalize learning to other settings. I am convinced that these assessments will be game changers in education.

To connect teachers with learning experiences of their own, the department is leveraging the power of social media and other technology to create Connected Online Communities of

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Practice. The goal is to build large and sustainable online communities that will allow teachers to share practices, access experts, and solve problems.

For technology to be truly transformative, it needs to be accessible to everyone. Unfortunately, that's not the case today, especially in rural areas, in low-income urban neighborhoods, and for students who have disabilities. The Obama administration has made a significant investment in expanding broadband to areas without access to high-speed internet. President Obama has set the goal of ensuring that 98% of the country has available broadband in the next five years. With $7.2 billion from the American Recovery and Reinvestment Act, the U.S. Department of Agriculture, the Department of Commerce, and the Federal Communications Commission are financing the construction of broadband networks into unserved areas. These dollars will provide high-speed internet in thousands of schools. In addition, the FCC has changed the E-Rate program to support innovative approaches that expand the reach of schools' networks. Schools are now allowed to use E-Rate funds to provide access during after-school hours, and a pilot program will test the use of wireless networks that students can access in their homes. These are essential investments for closing the digital divide, which would otherwise make the transformation to a digital classroom impossible in many of our communities.

All of these investments will help the transition from a predominantly print-based classroom to a digital learning environment. But using technology is not an end in itself. The ultimate goal is to vastly improve the opportunity to learn, accelerate achievement, and prepare students for success in the 21st century workforce. The ability to work, innovate, and be productive using technology is essential for professionals in almost every sector. Doctors and auto mechanics, architects and artists, engineers and teachers—these and just about every other profession will need workers who can harness the power of technology. For children to excel, we have to prepare them today.

We do so by unleashing the untapped potential of learning technology—with your commitment, passion, and expertise.

Arne Duncan is the U.S. secretary of education. Prior to his appointment, Duncan served as the chief executive officer of the Chicago Public Schools from June 2001 through December 2008.

Read ISTE's response to Duncan's article on page 14. Post your comments about this piece on the ISTE Community Ning (www.iste-community.org/group/landl).

See a demo of the Student Learning Center at ISTE booth 649 in Philadelphia!

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