



# OLR RESEARCH REPORT

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## **OLR BACKGROUNDER: BRINGING HIGH-SPEED INTERNET TO THE CLASSROOM**

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This report provides an overview of a federal initiative, announced on June 6, 2013, to digitize classrooms across the United States. Specifically, it describes the initiative's goals, potential impact, funding sources, and challenges. It also provides an overview of current Connecticut classroom Internet initiatives.

### **THE PROBLEM**

Helping students acquire the skills needed to get good jobs relies increasingly on new interactive educational tools and techniques. For example, digital textbooks can help students visualize and explore complex concepts, and computer programs can adjust lessons to the level of individual student knowledge and help teachers know precisely which lessons or activities are effective.

The Internet, in conjunction with computers, also offers many learning opportunities, providing instant access to information in text, video, and other forms. While the potential of the Internet to improve education is profound, millions of students lack adequate access to the Internet, which is compatible with the new educational technologies. Schools without high-speed broadband access can put their students at a disadvantage. High-speed broadband access performs at download speeds that are faster than "dial-up" Internet and uses devices such as DSL-enabled phone lines, cable TV modems, wireless connections, or fiber-optic connections.

Although the United States was once a pioneer in connecting schools to the Internet, it has fallen behind while other nations move forward, aggressively investing in digital learning and technology education. In South Korea, for example, all schools have high-speed Internet connections, and all teachers are trained in digital learning. For these reasons, the Obama administration has announced an initiative to help more schools and libraries connect to the Internet.

## **SUMMARY OF THE INITIATIVE**

The executive initiative, called ConnectED, aims to connect 99% of American students to next-generation broadband and high-speed wireless in schools and libraries within the next five years. Congressional action is not required, as the administration plans to draw upon various agencies' existing authority for funding and implementation.

ConnectED plans to provide computing devices to teachers and students so that they can experience digital lessons and classroom-tailored software. School districts would choose and purchase their own devices, and federal dollars would be available to fund these purchases.

The administration is basing the need for this initiative on the following administration-provided statistics:

1. the average school has about the same broadband capacity as the average American home, but serves 200 times as many users and
2. fewer than 20% of educators say their school's internet connection meets their teaching needs.

In Connecticut, several connectivity initiatives have been implemented or are underway. The Commission on Educational Technology (CET) is responsible for developing, overseeing, and directing the attainment of statewide educational technology goals. Since the 2005-06 school year, the Connecticut Education Network (CEN) has provided at least one school and library within each town with a high-speed Internet connection. Most recently, in July 2013, Governor Malloy and State Department of Education Commissioner Pryor announced the release of a \$10 million competitive technology grant program for Connecticut school districts to bring more computers into classrooms and increase Internet bandwidth capacity.

## **CONNECT-ED GOALS**

The ConnectED initiative addresses technological, curriculum-based, and private sector-related goals.

### ***Technological Goals***

By 2018, ConnectED aims to connect schools and libraries to the Internet through next-generation broadband and high-speed wireless technologies. On average, schools are currently as well-connected as private homes, but they have 200 times the number of Internet users. The number of users affects the time it takes to download or upload information from the Internet. Faster broadband speeds will help support the high volume of users in schools.

ConnectED aims for connectivity speed to be a minimum of 100 megabits per second (Mbps) with a target speed of 1 gigabit per second (Gbps) (1,000 Mbps). These speeds would exceed the stated goal of the Federal Communication Commission's (FCC) 2010 National Broadband Plan, which sets a bar that every household should have 4 Mbps Internet access by 2020.

### ***Curriculum Enrichment Goals***

The ConnectED initiative proposes to provide digital learning tools to more classrooms. Its goals include:

1. *Professional development for teachers.* The initiative will invest in support and training for every American educator in using education technology tools to improve student learning outcomes. The investment will also allow teachers to keep pace with changing technological and professional demands.
2. *Devices for the classroom.* ConnectED will give teachers and students access to electronic educational devices, allowing local educational officials to choose which devices to purchase for their schools.
3. *Real-time student assessments.* Digital education tools permit real-time (i.e., instantaneous, automatic) assessments of student learning, providing more immediate feedback to both teachers and students.

4. *Individualized learning.* Digital technology allows the creation of interactive, online lessons suited to students' individual needs, permitting students to work at their own speed and receive additional one-on-one help they might need.
5. *Global opportunities.* Through the Internet, students can build online learning communities, and teachers can collaborate with other educators across the country or the world.
6. *Global competitiveness.* American schools can keep pace with leading global competitors, who are aggressively investing in digital learning and technology education.

### ***Private Sector Goals***

The initiative also aims to boost economic growth by stimulating the demand for educational software. The administration predicts that ConnectED could create American jobs and export opportunities in a global education marketplace, the economic value of which it estimates to be over \$1 trillion. The administration also predicts that the initiative could create a market for “third-party validators” (i.e., consultants), who could help schools find educational software that provides content aligned with college- and career-ready standards.

## **CONNECT-ED IMPACT ON OTHER INITIATIVES**

### ***Standardized Testing***

The ConnectED initiative is being launched just before most states implement computer-based assessments aligned to the Common Core State Standards, a set of education standards for English Language Arts and mathematics that 45 states including Connecticut have adopted. These new assessments are primarily digital and will be given to students during the 2014-2015 school year in participating states. This digital testing format poses a problem for schools that do not have the computers or the bandwidth to test entire classes at once.

### ***Student Data Tracking***

ConnectED could help many states with their initiative to digitize student records. For example, several states have contracted with companies which run an electronic student database. The database stores student records in “the cloud,” an off-site storage system maintained by a third party, such as a remote server.

## **POSSIBLE FUNDING SOURCES FOR CONNECT-ED**

### ***E-Rate***

President Obama is calling upon the FCC to modernize and leverage the existing E-Rate program to become the primary funding source for ConnectED. Launched in 1996, E-Rate provides subsidies to broadband providers that offer discounted service to schools and libraries. Most of the schools that currently receive E-Rate funding have connection speeds that are similar to the average home broadband user, which is not enough to support large numbers of students using classroom Internet-based technology.

### ***Lifeline***

Lifeline is part of the Universal Service Fund (USF), a congressionally-mandated initiative directing the FCC to improve access to telecommunications services nationwide, especially in low-income, rural, insular, and high-cost areas. As a USF program, Lifeline provides telephone service discounts to eligible low-income households. FCC commissioner Jessica Rosenworcel and U.S. Senator Claire McCaskill have proposed ideas that either would repurpose or channel Lifeline funds for E-Rate program use, which might then be used to support ConnectED.

### ***Elementary and Secondary Education Act***

To fund the professional development of teachers who will implement and adjust to technological advances in the classroom, the administration proposes using already authorized funds. Two provisions in the Elementary and Secondary Education Act (ESEA) authorize funding to train teachers in how to use educational technology tools to improve student learning:

1. *Title II.* Title II funds help teachers keep pace with changing technology.
2. *Title V.* Funding is available under this title to train educators in using the technology needed to implement new, computer-based assessments of student learning.

## **POTENTIAL CHALLENGES**

### ***Device Costs to School Districts***

The cost of purchasing classroom technology is a common concern among school districts, which must weigh the cost of electronic devices in comparison to textbooks.

The Obama Administration maintains that leading technology companies are capable of producing educational devices that are price-competitive with basic textbooks. It also recommends that districts jointly purchase the devices to achieve greater cost savings.

### ***Internet Access in the Home***

ConnectED's success will also depend on home access. Teachers are increasingly assigning homework that requires the Internet and are using the Internet to enhance and add dimensions to traditional learning techniques through home instruction.

However, cost and lack of infrastructure are both obstacles to internet connectivity outside of schools. A 2011 U.S. Commerce Department Report, *Exploring the Digital Nation: Computer and Internet Use at Home*, found that as of October 2010, more than 68% of households used broadband Internet access service, up from 64% one year earlier. It also found that 77% of households had a computer – the principal means by which households access the Internet – compared with 62% in 2003.

The report found that lack of affordability is among the most important factors preventing households from subscribing to broadband Internet or dial-up service, as cited by 24% of the responding households without connectivity. These households cited both the initial cost of purchasing a computer and the recurring monthly subscription cost as important factors in their decision to not subscribe.

White House officials estimate that over a period of time, ConnectED could cost an additional 40 cents per month, or five dollars a year, on home phone bills. It offered several examples of how school districts addressed this issue. For example, North Carolina's Mooresville School District convinced a local, community-owned cable company to offer broadband access to students' families for \$9.99 monthly, plus free Wi-Fi connections in parks, local libraries, and municipal buildings.

## **CONNECTICUT INTERNET INITIATIVES**

Connecticut currently has an education technology commission, education network, and competitive grant program focused on achieving statewide education technology goals.

### ***Commission on Educational Technology***

The Connecticut Commission on Educational Technology (CET) is the state's principal educational technology policy advisor. By law, it must develop, oversee, and direct the attainment of statewide technology goals ([CGS § 4d-80](#)). These include:

1. connecting all public elementary and secondary schools, regional educational service centers, institutions of higher education, libraries, and other parties through a statewide high-speed, flexible network that allows for video, voice, and data transmission;
2. wiring all school classrooms and connecting them to the Internet and to the statewide network through wired, wireless, or other digital transmission technology providing high-speed connectivity;
3. providing access for all public schools, public libraries, and libraries at institutions of higher education to a core set of online, full-text resources and to the ability to buy them collaboratively; and
4. ensuring, in cooperation with the State Board of Education, competency in computing skills by the sixth grade for all students.

### ***Nutmeg Network***

The Nutmeg Network is a newly-formed entity governed by CET. It combines the Connecticut Education Network (CEN), the Public Safety Data Network, and the Connecticut Open Access Network.

CEN was established in 2000 to achieve statewide technology goals (see [CGS § 4d-82](#)). It provides at least one school and library within each town with a high-speed Internet connection. Connections were available in all school districts starting in the 2005-2006 school year.

The network was built using fiber-optic connections, with the Department of Administrative Services Bureau of Enterprise Systems and Technology and the University of Connecticut providing project management, network architecture, and operational support. The network initially consisted of 220 fiber sites throughout the state.

The state subsequently received funding under the federal Broadband Technology Opportunities Program (BTOP) to improve the CEN infrastructure, as well as to improve E-911 service. Under BTOP, Connecticut received a \$93.8 million federal grant to increase broadband infrastructure as well as a \$3.8 million federal grant for broadband mapping, developing a strategic plan, and establishing a state-level office to coordinate broadband policy and programs. The federal funding allowed for the addition of 120 sites in northwestern and northeastern Connecticut, as well as some points along the shoreline and around Colchester as part of CEN.

[PA 13-247](#) (the budget act) appropriates \$1,087,000 for the Nutmeg Network in FY 14 and FY 15.

### ***Competitive Technology Grant***

In July 2013, Governor Malloy and State Department of Education Commissioner Pryor announced a \$10 million competitive technology grant for Connecticut school districts to bring more computers into classrooms and to increase Internet bandwidth capacity. This grant is designed to assist local districts as they prepare for the statewide rollout during the 2014-15 school year of Common Core State Standards and the computer-based Smarter Balanced Assessments.

Interested school districts must apply through the competitive request for proposals process. Funding must be used to purchase new computing devices, inter-school bandwidth, or inter-district bandwidth. Grant awards depend on an applicant's ability to meet the submission requirements and a town wealth measure based on a 20% to 80% sliding scale. Proposals had to have been received by Monday, August 12, 2013.

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