

TECHNOLOGY AND DIGITAL LEARNING

KEY ISSUES

Keeping pace with technological developments is a daunting challenge for public schools. Many students and some teachers are “digital natives” whose lives outside of school are deeply impacted by the use of technology. In many school systems, by contrast, technology is peripheral at best. Used well, technology can be a tremendous support to teaching and learning, particularly with new and improved tools being released all the time. But technology can also be costly and susceptible to unrealistic hype and inefficient use. Schools struggle with the challenges of accessing modern technologies, financing telecommunications infrastructure, vetting the numerous content options available, and incorporating technology into classroom practice to enhance student learning.

Technology in public schools includes computers, digital learning, and interactive video, all of which can be used as the sole or primary vehicles for delivering content to students. Technology can also be used in combination with traditional face-to-face instruction, which is often referred to as “blended learning.” Distance learning and virtual learning enable students from all over the state, nation, and world, particularly those living in remote areas, to interact with teachers via various technological channels. Such options may be particularly useful in smaller schools because they give students access to sophisticated course offerings and content expertise that might otherwise be found only in larger, more comprehensive schools.

INTRODUCTION

The shift to elements of a digital-age learning model was one of the Public School Forum’s Top 10 Education Issues in 2015.¹ As we noted then:

North Carolina has recently pioneered numerous advances of technology for public schools. Providing computers and high-speed Internet access for students, offering online courses to students across the state, transitioning student data onto more advanced platforms, and preparing teachers to integrate technology into the classroom are just a few of the ways North Carolina is working to expand and improve the use of technology in schools.

Implementation of the state’s Race to the Top grant has crystallized North Carolina’s status as a leader in education technology. Examples of recent state-led initiatives, many of which were made possible by Race to the Top funding, include the School Connectivity and K-12 Cloud Computing initiatives; the North Carolina Virtual Public School, the nation’s second largest state virtual school with over 55,000 enrollments in 2014-15; Home Base, which enables access to student data and learning resources by teachers, students, parents, and administrators; and the North Carolina School of Science and Math’s online program focused on high school science, technology, engineering, and math (STEM) courses.

North Carolina has also been a visionary leader in education technology through the state’s e-Learning Commission, the State Board of Education’s Strategic Plan, the work of the House Study Committee on Education Innovation, and the efforts of numerous businesses, universities, and nonprofit organizations. North Carolina also maximizes the benefits of the federal E-Rate program, which helps make telecommunications and information services more affordable for schools by providing discounts for eligible services. Many North Carolina districts and charter schools have pushed the envelope on innovative uses of

¹ Public School Forum of North Carolina, *Top 10 Education Issues 2015*. Available at https://www.ncforum.org/wp-content/uploads/2015/01/PSF_TopTenEducationIssues_v5_web.pdf.

technology as well. For example, Mooresville Graded School District is routinely referenced as a national model for effective use of education technology.

Recent legislation set in motion a transition from textbooks to digital materials, and called for the development of digital teaching and learning standards for teachers and administrators. The legislature also made it a requirement that every student take at least one online course. And legislative leaders and the State Board have agreed on the need for statewide standards and plans related to wireless connectivity and broadband capacity.

To move its digital learning priorities forward, the state contracted with the Friday Institute for Educational Innovation at North Carolina State University to develop the North Carolina Digital Learning Plan, a comprehensive effort to envision and prepare for the transition to digital-age education. The transition will involve “changes in instructional practices, new types of educational resources, changes in classroom and school management, revised school staffing models, enhanced school and district technology infrastructure, Internet connected devices for all students and teachers, and educator training and support tailored to specific district and charter deployments.”²

FEDERAL LEGISLATION ON TECHNOLOGY IN PUBLIC SCHOOLS

As a part of the Telecommunications Act of 1996, the Federal Communications Commission (FCC) set up the Schools and Libraries Program (commonly known as “E-rate”) funded by the Universal Service Fund. The purpose of E-rate is to make telecommunications and information services more affordable for schools and libraries by providing discounts for eligible telecommunications, telecommunication services, internet access, and internal connections. The discount ranges from twenty to ninety percent, with schools or libraries in high poverty or rural areas receiving higher discounts. This program works through a competitive bid process for the desired service and the reimbursement of funds to eligible applicants through the Universal Service Administrative Company. Since the beginning of the program, demand for services has exceeded the cap all but one year. In 2013, schools and libraries in the US sought approximately \$4.9 billion in funding, more than double the 2013 cap of \$2.4 billion.³

In 2014, the FCC adopted the E-rate Modernization Order and the Second E-rate Modernization Order as part of a comprehensive review to modernize the program. In the Second E-rate Modernization Order, the FCC increased the cap for the E-rate program to \$3.9 billion in funding year 2015, indexed to inflation going forward. In the E-rate Modernization Order, the FCC refocused the program from legacy services to broadband by setting a target of \$1 billion in support for category two services (internal connections, managed Wi-Fi, and basic maintenance) to expand Wi-Fi to more than 10 million students in funding year 2015. The Order also phased down support for voice services by 20 percentage points each funding year and eliminated support for non-broadband, legacy services. Category one services (telecommunications, telecommunications services and Internet access services) will still be ensured funding. Funding is allocated first to the highest poverty schools and libraries, then the next highest poverty applicants, and continues down the list of applicants.⁴

Enacted by Congress in 2000, the Children’s Internet Protection Act requires schools to have an internet safety policy if they receive E-rate funds. The internet safety policy must include the blocking of any content considered to be obscene, pornographic, or harmful to minors. Schools must also monitor the online activities

² The Friday Institute for Educational Innovation, *North Carolina Digital Learning Plan: Policy Brief*.

³ Federal Communications Commission, FAQs on E-Rate Program for Schools and Libraries. Available at <http://www.fcc.gov/guides/universal-service-program-schools-and-libraries>.

⁴ Federal Communications Commission, FAQs on E-Rate Program for Schools and Libraries.

of minors and, as included in the Protecting Children in the 21st Century Act, educate minors about appropriate online behavior.⁵

The most comprehensive federal program supporting education technology in elementary and secondary schools is the Enhancing Education Through Technology Act of 2001. The program’s purpose is to increase technology access, technology-related teacher professional development, technology integration, and student technology literacy. It is specifically targeted to “high-need school districts” as defined by the number or percent of low-income students in the district or districts in substantial need for assistance in obtaining technology.⁶

NORTH CAROLINA DIGITAL LEARNING PLAN

In September 2015, the Friday Institute for Educational Innovation submitted the North Carolina Digital Learning Plan to the North Carolina State Board of Education—Department of Public Instruction. The Plan spotlighted activity, recommendations, and goals in six areas:

1. Technology infrastructure and devices
2. Human capacity
3. Content, instruction, and assessment
4. Local digital learning initiatives
5. Policy and funding
6. Regional and state support systems⁷

These six remain the key areas for development and investment in 2016. Proposed legislation and budgetary provisions since the release of the Digital Learning Plan have continued to reflect state leaders’ desire to prioritize investments in infrastructure, professional learning programs that enable the transition to digital-age teaching and learning, cooperative purchasing, and flexible policies. The detailed Plan and additional background can be found at <http://ncdlplan.fi.ncsu.edu>.

HOME BASE

Home Base is a statewide, instructional improvement (IIS) and student information system (SIS) for teachers, students, parents and administrators. Home Base was introduced in the 2013-14 school year and replaced NC WISE as the technology platform for data collection and monitoring. Teachers use Home Base to access student data and teaching and learning resources. Students can access their schoolwork, grades, and learning activities. Parents are able to view their child’s attendance and progress, and administrators can monitor data on students, teachers and schools.

NORTH CAROLINA VIRTUAL PUBLIC SCHOOLS (NCVPS)

The North Carolina Virtual Public School (NCVPS) is the nation’s second largest state-led virtual school with over 55,000 enrollments in the 2014-15 school year in all 115 North Carolina school districts. NCVPS offers over 150 secondary school courses online to students across the state, including course offerings in advanced placement, electives, traditional, honors, core, STEM, occupational course of study, and credit recovery courses. NCVPS began in 2007-08 and has served over 321,000 student enrollments since that first year.

⁵ Federal Communications Commission, Children’s Internet Protection Act. Available at <http://www.fcc.gov/guides/childrens-internet-protection-act>.

⁶ US Department of Education. Available at <http://www2.ed.gov/rschstat/eval/tech/netts/finalreport.pdf>.

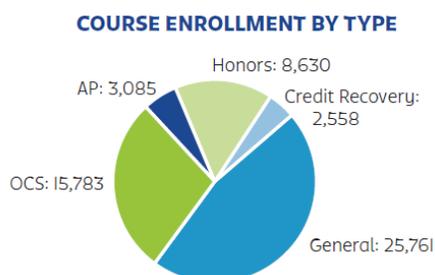
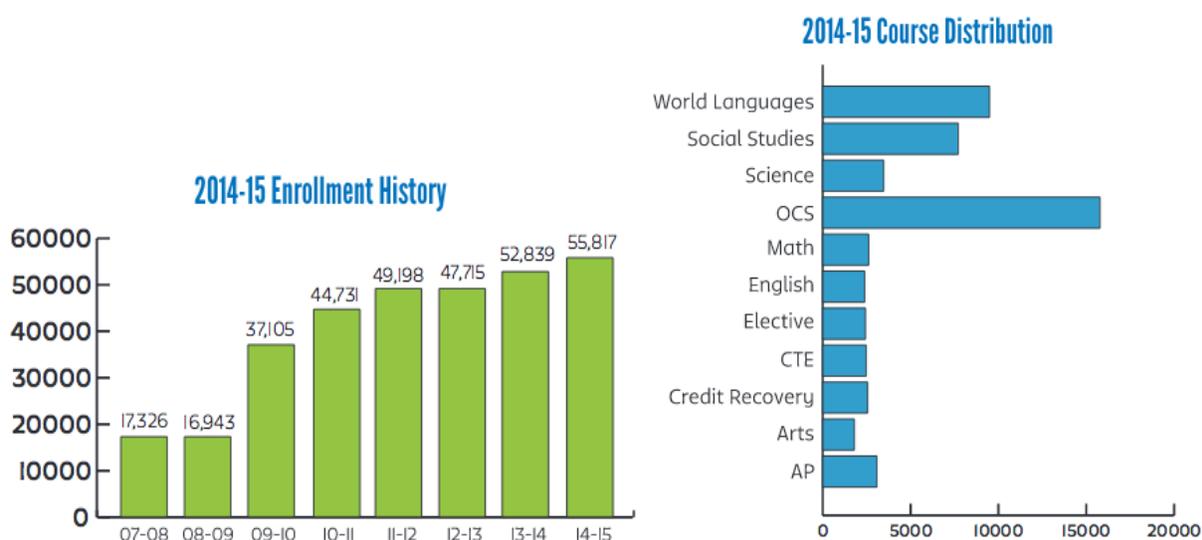
⁷ Friday Institute for Educational Innovation, *North Carolina Digital Learning Plan Summary*. Available at http://ncdlplan.fincsu.wpengine.com/wp-content/uploads/sites/10/2015/09/NCDLP_Summary8.31.15.pdf.

NCVPS is committed to closing the achievement gap between well-funded and poorly-funded school systems by providing access to world class learning opportunities for all North Carolina students. The NCVPS mission is to provide skills, student support, and opportunities for 21st century learners to succeed in a globally competitive world. The courses utilize Blackboard course management software to maximize student interaction in each class. NCVPS courses are taught by highly qualified teachers who employ video, interactive whiteboards, wikis, active worlds, and online discussion tools to engage 21st century learners.

The purpose of NCVPS is to provide courses that students are unable to take at their local schools and therefore enhance their learning experience. All courses are taught by certified teachers with experience in the subject matter. Once the online course is completed, the student receives credit on his or her school transcript from the student's participating school.

Initially, NCVPS courses were only offered to high school students. However, in recent years, course offerings have been made available for middle school students as well. In 2008, NCVPS added Learn and Earn Online. The Learn and Earn Program allows students in rural or low-wealth areas to be linked directly with universities to receive advanced instruction and earn up to two years of college credit while still in high school.

2014-15 NORTH CAROLINA VIRTUAL PUBLIC SCHOOL ENROLLMENT



NCVPS Numbers "To Know"	
Pass Rate	83.1%
2014-2015 Course Enrollments	55,817
2014-15 Unique Students Enrolled	35,966

**NCVPS PERCENTAGE OF ALL ENROLLMENTS FOR ADM GRADES 6-12
2014-2015 SCHOOL YEAR**



Based on ADM projections and enrollments for NCVPS funding formula published in 2014. Enrollments reported include multiple enrollments by unique students.

Source: North Carolina Virtual Public School 2014-15 Annual Report.
Available at http://www.ncvps.org/wp-content/uploads/2014-15_NCVPS-AnnualReport.pdf.

2014-15 NORTH CAROLINA VIRTUAL PUBLIC SCHOOL STUDENT PERFORMANCE

According to the NCVPS 2014-2015 Annual Report:⁸

- Total Enrollment for 2014-2015 was 55,817 course enrollments.
- Total Student Participation for 2014-15 was 35,966 students.
- 115 LEAs participated in NCVPS online courses.
- 61 charter schools participated in NCVPS online courses.
- Per student teacher pay for 2014-2015 was \$390 per year.
- The pass rate for students taking NCVPS courses in 2014-2015 was 83.1%.
- 46.2% of the students enrolled in NCVPS courses registered for General courses, 28.3% for Occupational Course of Study (OCS) blended courses, 15.5% for Honors courses, 4.6% for Credit Recovery courses, and 5.5% for Advanced Placement courses.
- The most popular NCVPS courses for 2014-2015 were OCS blended courses, world language courses, social studies courses, and science courses.
- The districts with the most NCVPS enrollments were Charlotte-Mecklenburg (6,947), Wake County Schools (5,707), New Hanover (2,751), Charter Schools (2,281), Cumberland County (1,848), and Cabarrus County (1,694).

NORTH CAROLINA SCHOOL OF SCIENCE AND MATH ONLINE

North Carolina School of Science and Mathematics (NCSSM) Online offers a supplemental, two-year, sequenced honors program that provides the NCSSM experience to students enrolled at their local schools.

⁸ North Carolina Virtual Public School 2014-15 Annual Report. Available at http://www.ncvps.org/wp-content/uploads/2014-15_NCVPS-AnnualReport.pdf.

NCSSM Online, begun in 2008, provides valuable preparation for college along with a learning community of accomplished, motivated peers.⁹

- **Institution.** North Carolina School of Science and Mathematics is a constituent campus of the University of North Carolina system.
- **Degree Type.** The online program provides an honors recognition certificate and option for an academic concentration. The residential program provides a high school diploma. Both programs provide a transcript.
- **Coursework.** Students take NCSSM Online courses outside of school or dual enroll the courses with their local school. Students take 1-2 courses per semester and earn a certificate for meeting program requirements. Shorter Accelerator and seminar courses explore special topics such as mechatronics, neuroscience research, and the research process.
- **Cost.** The program is tuition free. Special course fees, transportation costs, and technology access outside of home are the responsibility of the student/family. Some costs are waived for students meeting financial need eligibility.
- **Students.** The NCSSM Online Program serves 11th and 12th grade students. The Class of 2015 represented 55 counties throughout North Carolina.
- **Faculty.** Faculty hold advanced degrees in their content area of expertise and teach advanced courses in a college-like environment.
- **Size.** 115 students made up the NCSSM Online Class of 2015.
- **SAT.** The entering class of 2017 has mean SAT scores of 612 (Math), 592 (Critical Reading), and 568 (Writing).

RECENT SCHOOL LEGISLATION REGARDING TECHNOLOGY

DIGITAL LEARNING COMPETENCIES (S.L. 2013-11, HOUSE BILL 23)

The NC General Assembly passed HB 23 in its 2013 session requiring the State Board of Education to develop digital teaching and learning requirements for school administrators and students in school administrator preparation programs. These requirements must be met by school administrators to renew their license beginning July 1, 2017. This bill is meant to ensure high quality digital teaching and learning is provided to North Carolina students.

TRANSITION TO DIGITAL LEARNING IN SCHOOLS (S.L. 2013-12, HOUSE BILL 44)

The NC General Assembly passed HB 44 in March 2013, with the intent to transition from funding for textbooks, both traditional and digital, to funding for digital materials, including textbooks and instructional resources, to provide educational resources that remain current, aligned with curriculum and effective for all learners by 2017.

TRANSITION TO PERSONALIZED DIGITAL LEARNING (HOUSE BILL 660, 2015-16 SESSION)

This bill, passed by the House in 2015, would prepare for the next phase of the state's digital learning work, moving from the development of a comprehensive plan to the nuts and bolts of a major transition, including:

- Expanding the School Connectivity Initiative to improve schools' technology infrastructure
- Establishing a collaborative procurement service for districts

⁹ NC School of Science and Mathematics Online. Available at <http://www.ncssm.edu/online-program>.

- Improving access to digital learning resources to help schools move to digital curriculum materials by 2017 as required under current law
- Providing professional development for educators leading digital learning initiatives
- Creating a grant program to support development and dissemination of digital learning models

The bill would establish the North Carolina Digital Learning Initiative at the Friday Institute to support this work.