
TECHNOLOGY AND DIGITAL LEARNING

KEY ISSUES

Keeping pace with technological developments can be a challenge for public schools. Many students and some teachers are “digital natives” whose lives outside of school are deeply intertwined with 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. Schools struggle with the challenges associated with accessing modern technologies, from financing broadband infrastructure to vetting the numerous content options available and incorporating technology into classroom practice to enhance student learning.

Technology and digital learning in public schools includes the use of computers, tablets and other types of devices, 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

Enabling the transition to personal, digital-age learning models was one of the Public School Forum’s Top 10 Education Issues in 2017.¹ As we noted then:

North Carolina is transitioning our state from providing an industrial age, one-size-fits-all education to providing the personalized digital-age education K-12 students need to be successful in college, in careers, and as globally engaged, productive citizens. Important steps forward have been made by recent legislative actions that address preparing educators for digital learning, providing digital resources, and ensuring technology access across all schools. North Carolina has already made significant progress with statewide initiatives, such as those providing professional learning for educators and administrators, and many districts in the state have digital learning initiatives well underway. However, much remains to be done to ensure that all students throughout the state have equitable access to high-quality digital-age teaching and learning.

The Friday Institute for Educational Innovation at NC State University, in collaboration with Department of Public Instruction (NCDPI) and policymakers, education leaders, practitioners, business leaders and other partners from throughout the state, prepared the North Carolina Digital Learning Plan for the North Carolina State Board of Education. This Plan provides recommendations for state actions to support K-12 schools as they become digital-age learning organizations. The North Carolina General Assembly, via the 2016 Appropriations Act (SL 2016-94), provided funding and stipulated that the State Board of Education/NCDPI, in collaboration with the Friday Institute, carry out specific tasks for professional learning, cooperative purchasing of digital content, infrastructure maintenance and support, updating state policies, continuous improvement processes, and assessments for technological and pedagogical skills².

¹ Public School Forum of North Carolina, Top 10 Education Issues 2017.

Available at <https://www.ncforum.org/wp-content/uploads/2017/01/Top-10-2017-single-page-view.pdf>.

² Session Law 2016-94, House Bill 1030 Section 8.23.

Available at <https://www.ncleg.net/enactedlegislation/sessionlaws/html/2015-2016/sl2016-94.html>.

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 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

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, Summary of the Second E-Rate Modernization Order. Available at <https://www.fcc.gov/general/summary-second-e-rate-modernization-order>.

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. Evaluation of the Enhancing Education Through Technology Program: Final Report Available at <http://www2.ed.gov/rschstat/eval/tech/netts/finalreport.pdf>.

NORTH CAROLINA DIGITAL LEARNING PLAN

In 2013, The Friday Institute was commissioned to begin working on a long-term Digital Learning Plan (DLP) for the state of North Carolina. This plan was created to:

1. Research current digital activities and practices statewide in K-12 schools, and districts.
2. Make recommendations to the State Board of Education and Legislature based on research findings.

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. Human Capacity: provide adequate support structures for teachers and school leaders to develop and implement digital learning competencies and ensure graduates are ready to engage in digital-age schooling.
2. Regional and State Support Systems: establishment of the North Carolina Digital Learning Collaborative, and regional digital learning networks.
3. Content, Instruction, and Assessment: provide digital tools for educators to use student data as a tool for curricula improvements, as well as creating an open-share network for teacher-created resources.
4. Technology, Infrastructure, and Devices: expand the School Connectivity Initiative to all schools statewide, and expand community/home access to broadband ensuring connectivity for all students.

5. Local Digital Learning Initiatives: provide systems of support, including grant funding, to local LEAs to implement digital learning initiatives.

6. Policy and Funding: support State and local funding models that offer flexibility for local digital learning initiatives and innovations, and ensure equity of digital learning opportunities for all students.⁷

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.⁸

⁷ Friday Institute for Educational Innovation, North Carolina Digital Learning Plan. Available at <https://ncdli.fi.ncsu.edu/dlplan/docs/dlplan.pdf>.

⁸ NC Public Schools, About Home Base. Available at <https://homebase.ncpublicschools.gov/about>.

NORTH CAROLINA VIRTUAL PUBLIC SCHOOLS (NCVPS)

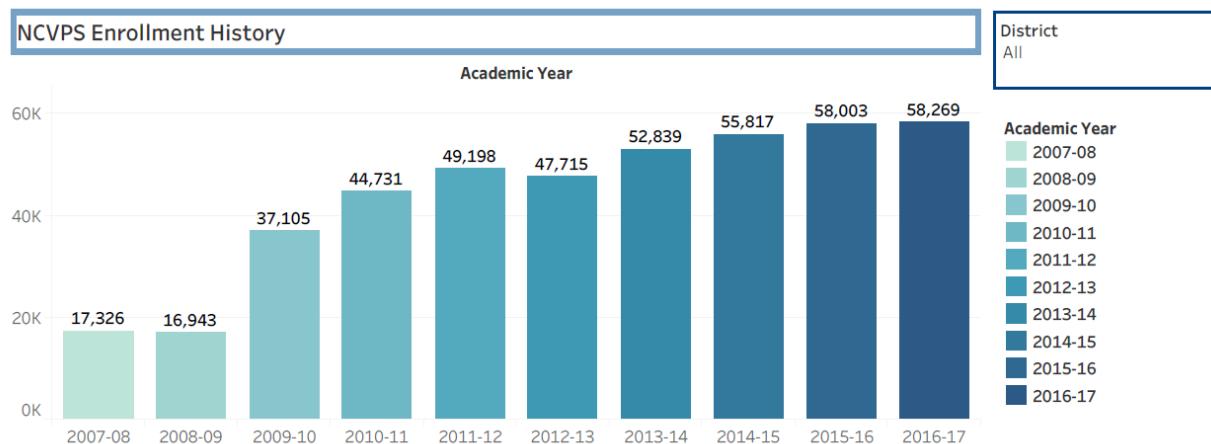
The North Carolina Virtual Public School (NCVPS) is the nation's second largest state-led virtual school with over 58,000 enrollments in the 2016-17 school year in all 115 North Carolina school districts. NCVPS offers over 150 secondary school courses online to students across the state, including course 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 almost 438,000 student enrollments since that first year.

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 school⁹.

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, which is an extension of the face-to-face Learn and Earn program that allows students in public high schools to earn college credit. The 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.¹⁰

2016-17 NORTH CAROLINA VIRTUAL PUBLIC SCHOOL ENROLLMENT

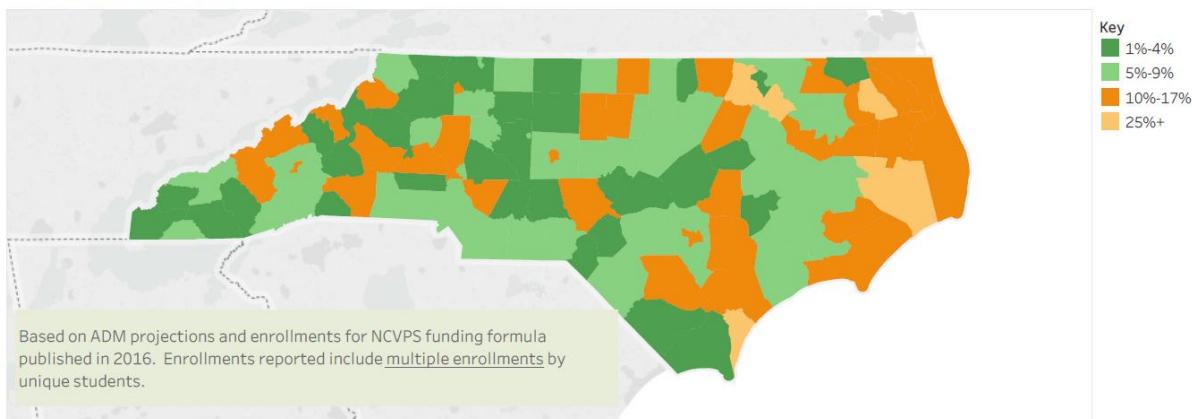


⁹ North Carolina Virtual Public Schools, Annual Report 2016-17.

Available at <https://ncvps.org/ncvps-annual-report-2016-2017-draft>.

¹⁰ Learn and Earn Online: A National Model of Innovation in Prekindergarten-20 Education. Available at: <https://www.ncleg.net/documentsites/committees/JLEOC/Reports%20Received/Archives/2009%20Reports%20Received/Learn%20and%20Earn%20Online%20Sites.pdf>.

NCVPS PERCENTAGE OF ALL ENROLLMENTS FOR DISTRICT ADM, GRADES 6-12
2016-2017 SCHOOL YEAR



Source: North Carolina Virtual Public School 2016-17 Annual Report.
Available at <https://ncvps.org/ncvps-annual-report-2016-2017-draft>.

2016-17 NORTH CAROLINA VIRTUAL PUBLIC SCHOOL STUDENT PERFORMANCE

According to the NCVPS 2016-2017 Annual Report:¹¹

- Total Enrollment for 2016-2017 was 58,269 course enrollments.
- Total Student Participation for 2016-17 was 36,149 students.
- 115 LEAs participated in NCVPS online courses.
- 79 charter schools participated in NCVPS online courses.
- Per student teacher pay for 2016-2017 was \$390 per year.
- The pass rate for students taking NCVPS courses in 2016-2017 was 86.3%.
- 41.3% of the students enrolled in NCVPS courses registered for General courses, 32% for Occupational Course of Study (OCS) blended courses, 17.6% for Honors courses, 2.2% for Credit Recovery courses, and 6.8% for Advanced Placement courses.
- The most popular NCVPS courses for 2016-2017 were OCS blended courses, Success 101, and science courses.
- The districts with the most NCVPS enrollments were Charlotte-Mecklenburg (6,348), Wake County Schools (5,393), New Hanover (3,549), Charter Schools (3,414), Cumberland County (2,546), and Cabarrus County (2,359).

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. NCSSM Online, begun in 2008, provides valuable preparation for college along with a learning community of accomplished, motivated peers.¹²

- **Institution.** North Carolina School of Science and Mathematics is a constituent campus of the University of North Carolina system.

¹¹ North Carolina Virtual Public School 2016-17 Annual Report.

¹² NC School of Science and Mathematics Online. Available at <http://www.ncssm.edu/online-program>.

- **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 mechanatronics, 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.** 184 students made up the NCSSM Online Class of 2018.
- **SAT.** The entering class of 2018 has mean SAT scores of 612 (Math), 594 (Critical Reading), and 552 (Writing).¹³

RECENT SCHOOL LEGISLATION REGARDING TECHNOLOGY

SCHOOL CONNECTIVITY INITIATIVE (S.L. 2007-323)

In 2007, the School Connectivity Initiative was created with a focus on connecting every school district to broadband internet access, bringing all districts into the 21st century. This initiative was led in partnership by MCNC, The Friday Institute, ITS, and NC DPI, and is sponsored and monitored by NC DPI.¹⁴ In the spring of 2018, the initiative met its goal of connecting all school districts with broadband internet access. North Carolina has become the first state to integrate broadband access to all school districts in the nation. This was considered a first step in the process. Next steps include training for students, school leaders, as well as data management trainings and integrating technology into curricula.¹⁵

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.¹⁶

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

¹³ NC School of Science and Math, Online Profile 2017-18. Available at <https://www.ncssm.edu/uploads/files/88585506310865994-online-profile-2017-18.pdf>.

¹⁴ DPI, Connectivity Services. Available at <http://www.ncpublicschools.org/connectivity/>.

¹⁵ Marchello, L. (23 May, 2018) Carolina Journal. Available at

<https://www.carolinajournal.com/news-article/fcc-chairman-visits-north-carolina-high-school-to-celebrate-school-connectivity/>.

¹⁶ Session Law 2013-11, House Bill 23. Available at <https://www.ncleg.net/Sessions/2013/Bills/House/PDF/H23v5.pdf>.

resources, to provide educational resources that remain current, aligned with curriculum and effective for all learners by 2017.¹⁷

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
- 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 established the North Carolina Digital Learning Initiative at the Friday Institute to support this work.¹⁸

¹⁷ Session Law 2013-14, House Bill 44. Available at <https://www.ncleg.net/Sessions/2013/Bills/House/PDF/H44v3.pdf>

¹⁸ Session 2015-16. House Bill 660. Available at <https://www.ncleg.net/Sessions/2015/Bills/House/PDF/H660v2.pdf>