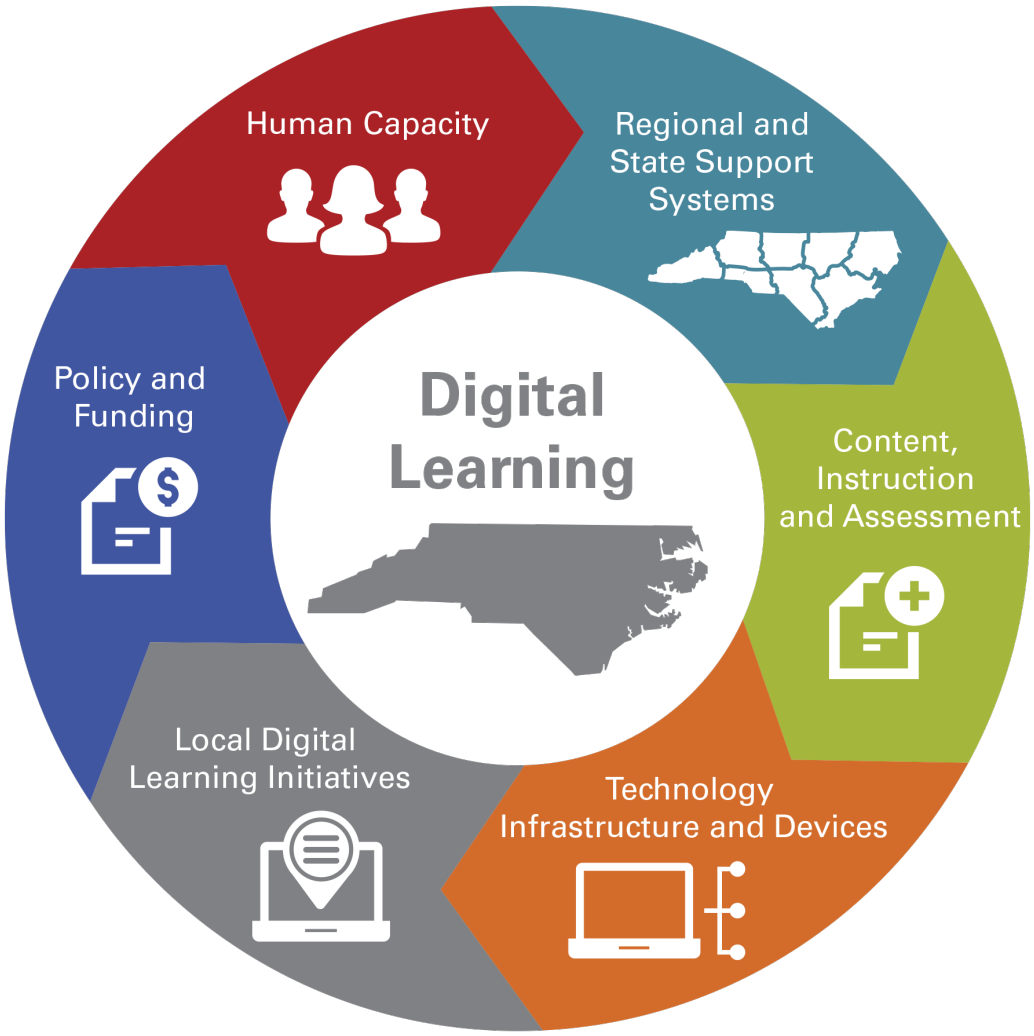
NORTH CAROLINA DIGITAL LEARNING PLAN

Detailed Plan
September 2015

Prepared by the Friday Institute for Educational Innovation for the North Carolina State Board of Education-Department of Public Instruction



THE WILLIAM & IDA FRIDAY INSTITUTE FOR EDUCATIONAL INNOVATION

NC STATE UNIVERSITY College of Education

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INTRODUCTION

North Carolina is committed to providing the personalized digital-age education K-12 students need to be successful in college, in careers, and as globally engaged productive citizens. North Carolina already has made significant progress through statewide and local efforts. Recent legislative actions that address preparing educators for digital learning, providing digital resources, and ensuring technology access across all schools, as well as the goals of the State Board of Education Strategic Plan, are important steps in moving forward, and many schools and districts[1] also 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 learning.

The transition to a digital-age education system that fully harnesses the power of modern technologies will impact all aspects of education, including the content students learn, the methods teachers use, where and when learning takes place, what resources are required, and how success is defined and measured. Systemic changes in K-12 education are required in order to effectively prepare students for the rapidly changing, interconnected, technology-driven world.

This North Carolina Digital Learning Plan has been developed to provide recommendations for state actions that will support K-12 schools as they become digital-age learning organizations. It was prepared for the North Carolina State Board of Education and Department of Public Instruction (NCDPI) by the Friday Institute for Educational Innovation at NC State University, working in collaboration with educators, policymakers, and other stakeholders across the state.

This North Carolina Digital Learning Plan document, a 12-page summary, and additional resources that informed the development of the Plan, are available on the NC Digital Learning Plan web site: http://ncdlplan.fi.ncsu.edu.

[1] In this document, Local Education Agency (LEA) and school district are used interchangeably.

Digital-Age Teaching and Learning

Innovative approaches to teaching and learning that make effective use of digital technologies can be found in K-12 schools throughout North Carolina. The educators leading these innovations are breaking new ground in the transition from a traditional model of classroom teaching, which was designed to address the needs of industrial-age students, to a digital-age model of teaching and learning, designed to prepare students for the global, digital, connected, rapidly changing world in which they live. At the core of this transition is moving from a system of *mass education*, in which content, pedagogy, and student experiences were largely standardized, to a system of *personalized education*, which is responsive to how each individual student learns most effectively. Figure1 highlights some of the major changes involved in this historic transition.

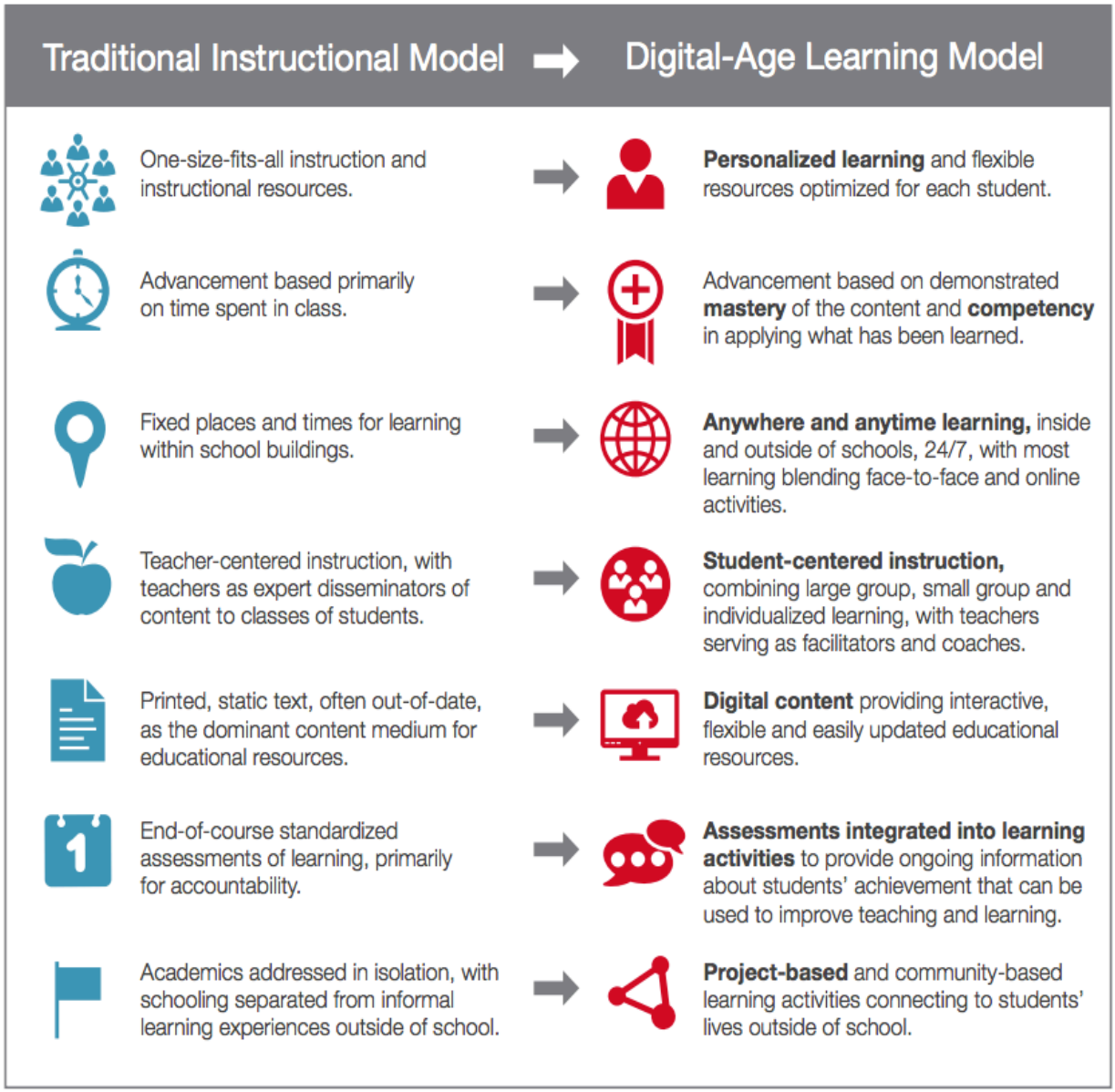

Figure 1: Comparing Traditional and Digital-Age Education Models

A successful digital learning transition requires addressing many components of the education system. The *NC Digital Learning Progress Rubric*, which districts and schools use to self-assess their progress and inform their planning, includes the following five major categories shown in Figure 2:
(1) leadership;
(2) professional learning;
(3) digital-age content and instruction; (4) technology infrastructure and devices; and (5) effective use of data and assessment. The success of North Carolina's transition to digital-age teaching and learning depends upon local district and school leadership teams planning and implementing digital learning initiatives that address all of these components.

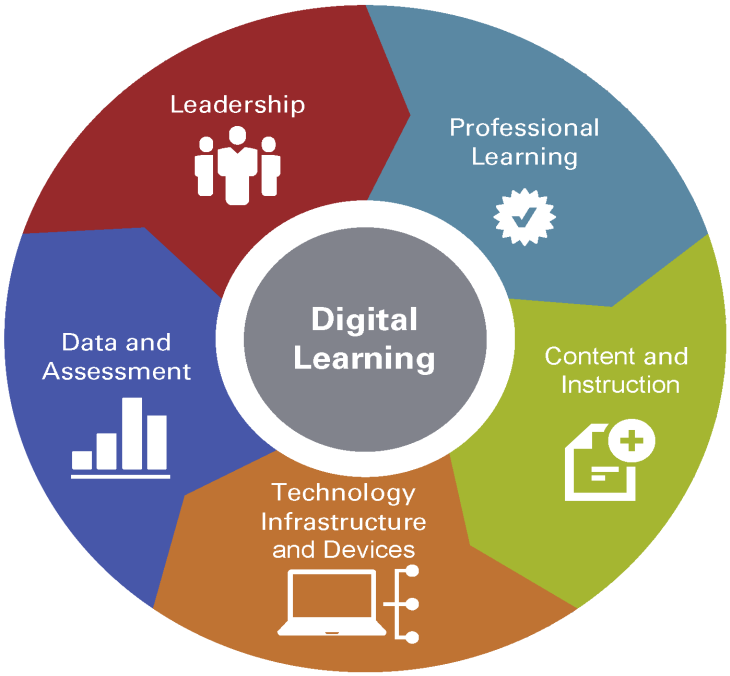

Fig 2: Digital Learning Progress Rubric Categories

The challenge for North Carolina to fully embrace digital-age learning is to progress from local digital learning initiatives to a systemic update of the entire K-12 system so that it provides all K-12 students with the modern education they need to be ready for college, careers, and citizenship.

The NC Digital Learning Plan proposes to address this critical challenge through the creation of the *NC Digital Learning Collaborative* (NCDLC) to *support North Carolina educators in providing effective, digital-age learning opportunities to all public school students throughout the state.* This document describes specific recommendations focused on how the State, through NCDLC, can best provide the guidance, supports, and resources local educators need to achieve that goal. This effort will require the collaboration and work of many organizations. Recommendations for the organization of NCDLC are provided in the section on Regional and State Support Systems.

North Carolina Digital Learning Foundations

Digital learning-focused programs and projects across the state have grown substantially since LEARN NC[2] at the UNC-Chapel Hill School of Education began providing online professional development and standards-aligned curriculum resources to teachers almost 20 years ago. NCDPI has been providing teachers with access to online resources for use in class projects and homework assignments via NC WiseOwl since 1999. Since 2003, 55 public schools in 32 North Carolina school districts have been involved with the implementation of NCDPI's IMPACT model, which is designed to facilitate the infusion of instructional technology into schools through an extensive, structured media and technology program. NC State University's Center for Urban Affairs and Community Services (CUACS), under contract to NCDPI, has supported the development, delivery, and reporting of online assessments since the 2005-06 school year, when all 8th graders were first administered the Online Test of Computer Skills. The School Connectivity Initiative, launched in 2006, provides sustainable Internet access and network support to all LEAs and charter schools in partnership with the Friday Institute and MCNC. Since 2002, NCDPI has partnered with Intel Teach to support teachers with tech integration through a train-the-trainer blended model. The North Carolina Virtual Public School (NCVPS) offered its first online courses during Summer 2007 and has grown to 736 instructors who teach more than 35,000 students from a catalog of over 200 courses. The North Carolina Learning Technology Initiative (NCLTI), a collaboration of NCDPI, the Friday Institute, the Golden Leaf Foundation and SAS, has provided a planning framework, technical assistance, and professional development for technology-enabled learning in 53 LEAs since 2007.[3] NCDPI, with federal Race to the Top funding, has implemented a suite of tools known collectively as Home Base, which includes systems for managing student information, instructional improvement, educator evaluation, and professional learning. The Friday Institute led the development of the NC Education Cloud, also funded by Race to the Top, to provide integration platforms and centrally procured cloud-based solutions to support school and district access to online tools, content, and services.

Most importantly, many innovations in digital-based instructional practices have originated from North Carolina LEAs and charter schools. The Golden Leaf Foundation has provided funding for digital learning initiatives in many North Carolina districts, and many districts used some of their Race to the Top funding to further their digital learning programs. Data from the 2015 Annual Media and Technology Report (AMTR) identifies 688 schools in 93 districts that have one-to-one programs in which every student and teacher across selected grade levels has a connected digital device—more than twice the number of schools with one-to-one programs identified in the 2013 survey. Figure 3 shows, by district, the percentage of one-to-one schools as of June 2015, and additional one-to-one programs are beginning during the 2015-16 school year.

The NC Digital Learning Plan builds upon the strong foundation provided by these and other North Carolina programs that already have made the state a leader in digital learning.

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[2] LEARN NC has suspended its PD course offerings due to a lack of funding.
[3] NCLTI was established in response to SL 2007-323 Section 7.39 with $3M in non-recurring funding.

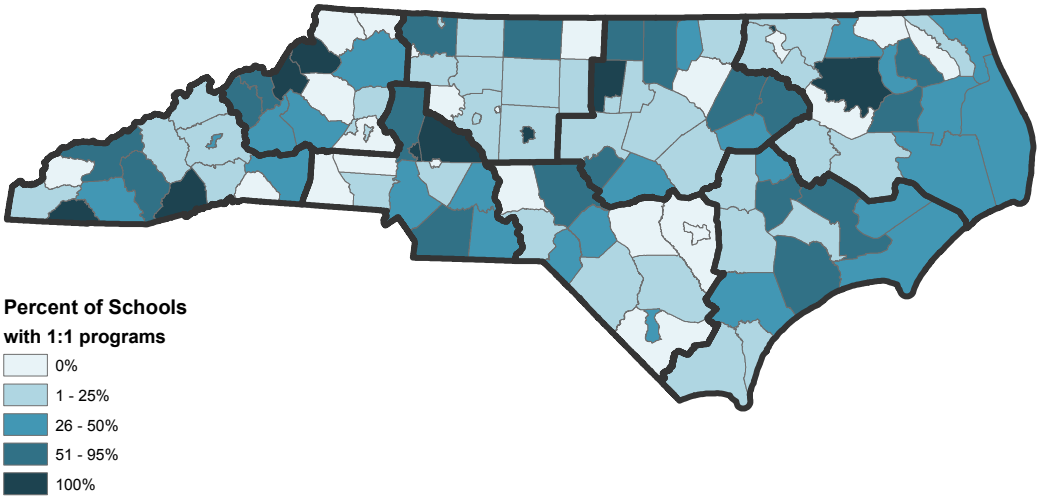

Figure 3: Percent of Schools with 1:1 Programs by District, as of June 2015

Process and Outreach in Developing this Plan

For the past year, the Friday Institute has led a multi-faceted planning process that built upon extensive prior research and work on digital learning initiatives with schools and districts across North Carolina. The process involved close collaborations with NCDPI staff, an advisory board representing North Carolina education stakeholder groups, and working groups of educators for each of the major components of the plan. It included deep-dive visits during which staff members spent several days in each of 18 districts, along with visits to charter schools. We also held meetings with groups of superintendents, principals, teachers, technology directors, parents, and students; the Deans of Education of both the UNC system schools and independent colleges and universities; local school board members; legislators; business leaders; non-profit education organizations; and others. We gathered data and analyzed the technology infrastructure in all K-12 public schools, using the information to help the NCDPI Connectivity team prepare the state's E-Rate application. In addition, we conducted reviews of the research on digital learning programs and gathered information about initiatives and strategies from other states and large districts. This May, at the request of the North Carolina State Board of Education, all 115 LEAs and 120 charter schools completed a digital learning progress rubric self-assessment, the data from which provides an overview of progress throughout the state on the five major components of digital learning plans described above.

The overall project organization and governance structure for developing this plan is shown in Figure 4. The oversight, leadership, advisory groups, and management are described in greater detail below.

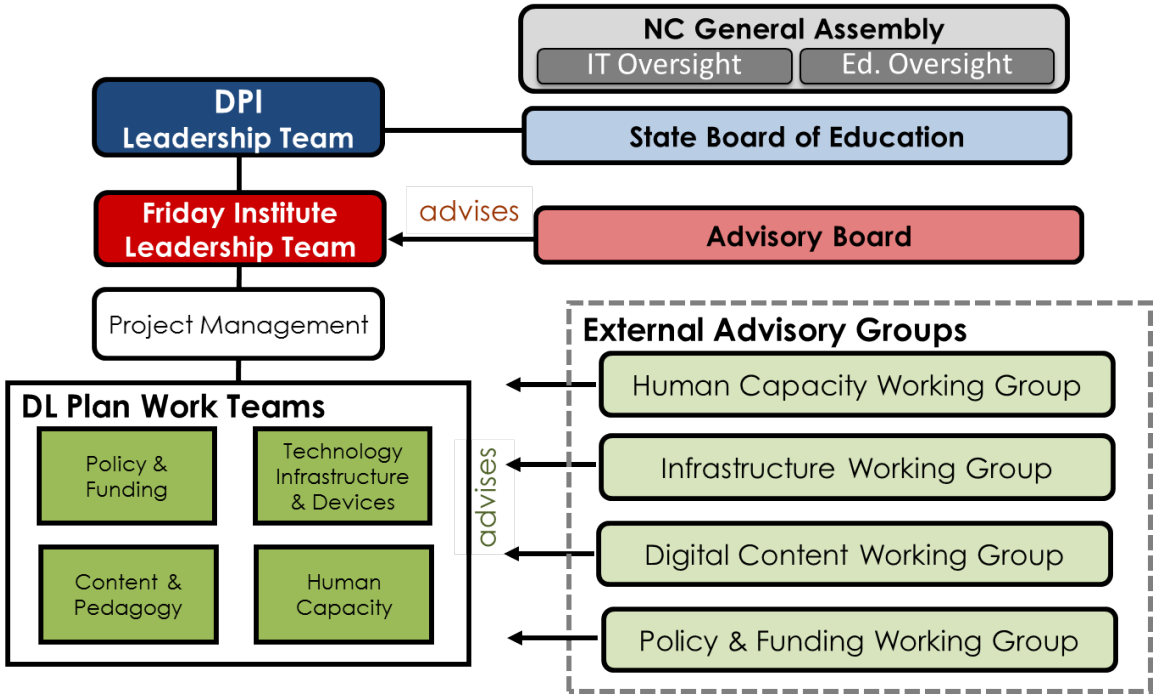

Figure 4: North Carolina Digital Learning Plan Organization and Governance

NCDPI Oversight

The North Carolina State Board of Education provided overarching governance for and oversight of the digital learning plan work. The NCDPI digital learning leadership team—Philip Price, Chief Financial Officer; Tracy Weeks, Chief Academic and Digital Learning Officer; and Michael Nicolaides, Chief Information Officer—provided direct oversight for the work.

The Digital Learning Plan Leadership Team was in frequent communication with the NCDPI team and reported to the State Board of Education as requested. The Leadership Team also worked with NCDPI and the State Board to provide updates to the members of the North Carolina General Assembly, the Office of the Governor, and the Office of the Lieutenant Governor.

Friday Institute Leadership Team

The Friday Institute Leadership Team for the NC Digital Learning Plan was comprised of: Glenn Kleiman, Executive Director; Mary Ann Wolf, Director of Digital Learning Programs; Jeni Corn, Director of Evaluation Programs; Phil Emer, Director of Technology Planning and Policy; Mark Samberg, Technology Innovations Manager; and Trip Stallings, Director of Policy Research, each of whom brought extensive relevant experience and expertise in areas central to the planning effort.

This Leadership Team was responsible for project planning, implementation, and management. The team set direction and supervised multiple Work Teams that were each responsible for specific areas, as described below. The Leadership Team was responsible for coordinating and synthesizing the efforts of the Work Teams to produce a coherent, systematic plan that addresses all the elements required to foster successful digital learning transitions in K-12 schools statewide.

Advisory Groups

An Advisory Board comprised of North Carolina education, government, and business leaders helped guide the work of the Leadership Team by reviewing plans, findings, and recommendations. In consultation with NCDPI leadership, the Friday Institute identified 24 individuals to serve on this Board, with a goal of representing all major stakeholder groups. The Board met twice a year, beginning in September 2014. Members were able to participate either in person or via video or audio conferencing to enable participation by members from across the state.

The Friday Institute Work Teams also convened their own External Advisory groups, which consisted of representatives from LEAs, IHEs, NCDPI, and other relevant organizations. These external stakeholder groups advised, guided, and reviewed the Work Team plans, findings, and recommendations. Each Work Team established the schedule for the meetings of these groups in accordance with its own timeline.

Friday Institute Work Teams

The work was divided among four major Work Teams focused on Human Capacity, Content and Instruction, Funding and Policy, and Technology Infrastructure and Devices. Each Work Team consisted of a Coordinator and team members with deep expertise in the relevant areas who were responsible for gathering and synthesizing relevant information. A designated member of the Leadership Team also provided each Work Team with advice and made sure the work was well coordinated with that of the other Teams.

Data-Driven Approach

The Friday Institute employed a capacity building and needs assessment framework to guide collection, organization, and analysis of the data that informed the development of the NC Digital Learning Plan. Researchers across the Institute were assigned to each Work Team. Within each Team, qualitative and quantitative data were collected and analyzed during three distinct phases of the project, as shown in Figure 5.

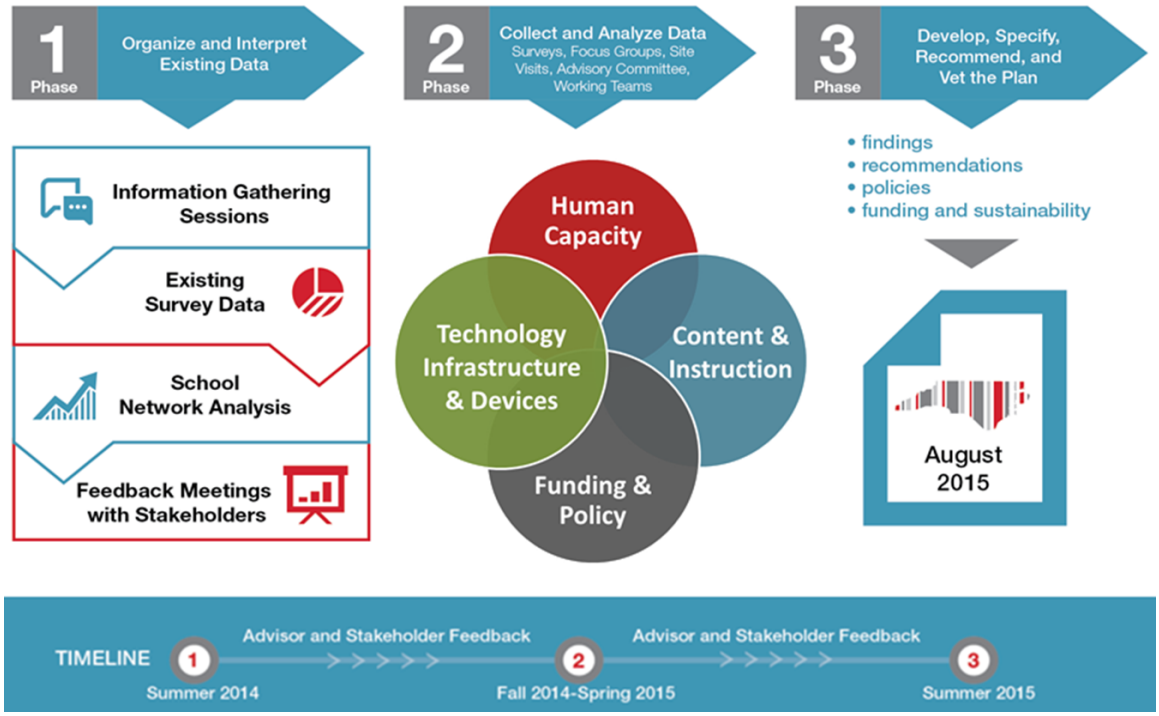

Figure 5: Three Phases of the Data Collection and Analysis Process

Phase 1 of this research focused on organizing and interpreting pre-existing data that identified local assets already in place statewide to support digital learning. Part of this effort also included engaging the External Working Groups and Advisory Boards referenced above. Quantitative data sources included the Race to the Top Cloud Computing Initiative Wireless & 1:1 Survey, the North Carolina Teacher Working Conditions Survey, the Project Tomorrow Speak-Up Survey, and others (see Table 1).

During Phase 2, the Team changed its focus to collecting and analyzing new data through interviews, focus groups, observations, and survey data that identified assets and needs associated with the plan's four focus areas. Members of each Work Team participated in "deep dive" site visits to a representative sample of 18 districts across the state. One hundred and sixty-four interviews and focus groups with policymakers, district leaders, educators, students, and parents were conducted during these visits to determine the digital learning strengths and needs at the district, community, and state levels. In addition to site visits, a Wireless Infrastructure Survey solicited data on the current state of the wired and wireless network infrastructure of all North Carolina schools and districts, including information about specific vendors used, technologies in place, architectural characteristics of schools, age of equipment, and other supporting information. This data was used to inform a statewide procurement of school wired and wireless infrastructure and related services to support the E-Rate application process. The NC Digital Learning Progress Rubric provided quantitative data to help identify each district's current stage of development in digital learning across five major areas: Leadership, Professional Learning, Content & Instruction, Technology Infrastructure & Devices, and Data & Assessment. With the support of the Lieutenant Governor's office and the State Board of Education, all 115 LEAs and 120 of the 146 Charter Schools completed the Digital Learning Progress Rubric. Phase 2 also included a series of town hall meetings, stakeholder member checks with external advisory groups, and feedback

interviews with the Digital Learning Plan Advisory Board, NCDPI, Regional Education Service Agency (RESA) representatives, and several other education organizations to verify the accuracy and credibility of the findings. Since June 2014, the NC Digital Learning Plan team has presented 78 times to key stakeholder groups, including representatives from every North Carolina school district, RESAs, education associations, industry partners, public and private universities, community colleges, foundations, county commissioners, local school boards, elected officials, and other government agencies.

During Phase 3, data collected in Phases 1 and 2 were used to inform development of the final North Carolina Digital Learning Plan recommendations.

Phases	Data Source
1	• North Carolina Teacher Working Conditions Survey • School Technology Needs Assessment (STNA) Survey for Teachers • North Carolina Department of Public Instruction (NCDPI) Annual Media and Technology Report • Friday Institute STEM Surveys • North Carolina Race to the Top Evaluation Omnibus Survey • Project Tomorrow Speak Up Survey • North Carolina Race to the Top Evaluation Professional Development Coordinator Survey • Race to the Top Cloud Computing Initiative Wireless & 1:1 Survey • Project 24 School or District Digital Learning Needs Assessment Survey • Stakeholder Member Checks (DL Plan Advisory Committee, NCDPI, etc.) • Information Gathering Surveys
2	• 18 District Deep Dive Site Visits (District and School Administration, Teachers, Students, Parents, Local Policymakers, Community Members) • Focus Groups and Interviews • Town Hall Meetings • Stakeholder Member Checks (DL Plan Advisory Board External Working Groups, NCDPI, etc.) • North Carolina Digital Learning Progress Rubric • Wireless Infrastructure Survey
3	• Aggregated Data from Phase 1 & 2 • Advisory Board and NCDPI Leadership Team Feedback

Table 1: Data Sources that Informed the Digital Learning Plan Recommendations

General Findings

We found innovative programs, planned and implemented by creative and dedicated educators, throughout North Carolina. As mentioned earlier, IMPACT, NCVPS, LEARN NC, NC WiseOwl, the North Carolina Learning Technologies Initiative, CUACS, NCTest, the School Connectivity Initiative, North Carolina Education Cloud, and Home Base represent centrally supported initiatives that provide models and foundations for a sustained digital learning environment. In addition, LEAs and charter schools have developed impressive programs to forward local instructional goals. Some of these programs are well underway and already have demonstrated successful impact on teaching practices, student engagement, and student learning. Others are at initial stages of development, but are showing early signs of success. These programs provide models and lessons learned that can influence digital learning initiatives in other schools and districts.

We also found that all stakeholder groups, from elementary school students to local school board members and Deans of colleges of education, agree that fundamental changes are needed in our K-12 education system to prepare our students for their futures. Members of the business community and state policymakers also agree. Everyone involved is looking for clarification about the specific changes needed and how we can collectively go about making them, and everyone also has concerns about the process of change and potential negative outcomes. Moving forward successfully will require providing clear models of digital-age learning; supporting schools and districts during the change process; and addressing concerns about responsible use, student safety, privacy, and other issues.

Our findings also validate the importance of addressing all the components of the transition to digital-age learning. Specifically, places that began by purchasing equipment, without a well-developed plan to address leadership, professional learning, content and instruction, and data and assessment, have not successfully improved teaching and learning.

The May 2015 results from the Digital Learning Progress Rubric provide a picture of progress so far throughout the state. Leaders from each of the 115 LEAs responded to 25 items, grouped into the five categories shown in Figure 2 above, rating their district on a 1 to 4 scale depending upon where they were from the early to target stage of progress on that item. Figure 6 shows the number of Local Education Agencies (LEAs) that fall into each of the four levels of progress overall and on each of the five specific areas—(a) leadership; (b) professional learning; (c) content and instruction; (d) technology infrastructure and devices; and (e) data and assessment. Figure 7 shows the same data for the 120 charter schools that responded. Figure 8 shows the overall self-assessment progress rating from each LEA, grouped by the eight education regions.

The results show that the substantial majority of LEAs (88 of 115) are in either the early or advanced developing phase of their digital learning initiatives, which means they have begun to prepare educators for the changes, have some of the required technology in place, incorporate some digital content and digital-age approaches in classrooms, and employ data to inform some decisions. In many cases, there are digital learning initiatives in only selected schools, grades, or content areas, so there is a long way to go to reach the advanced level, which requires systemic reforms.

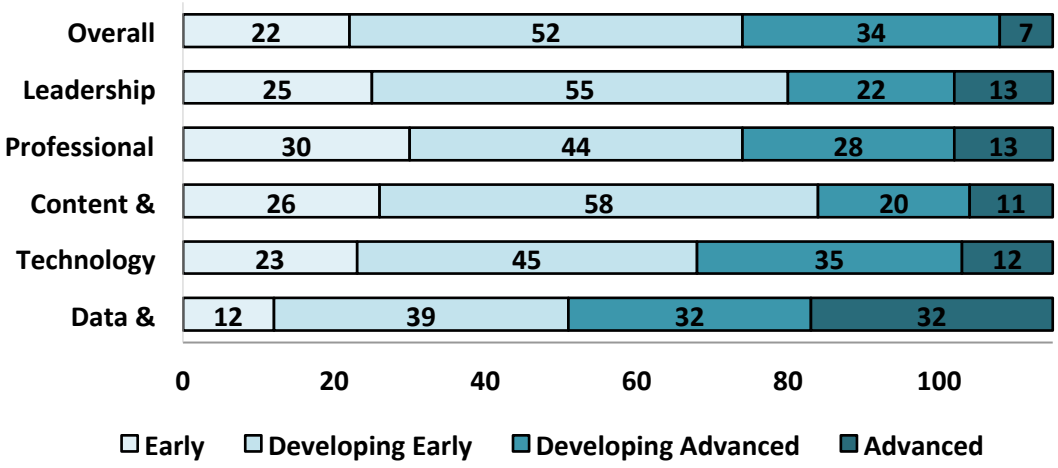

Figure 6: LEA Self-Assessment Data Overall and by Area

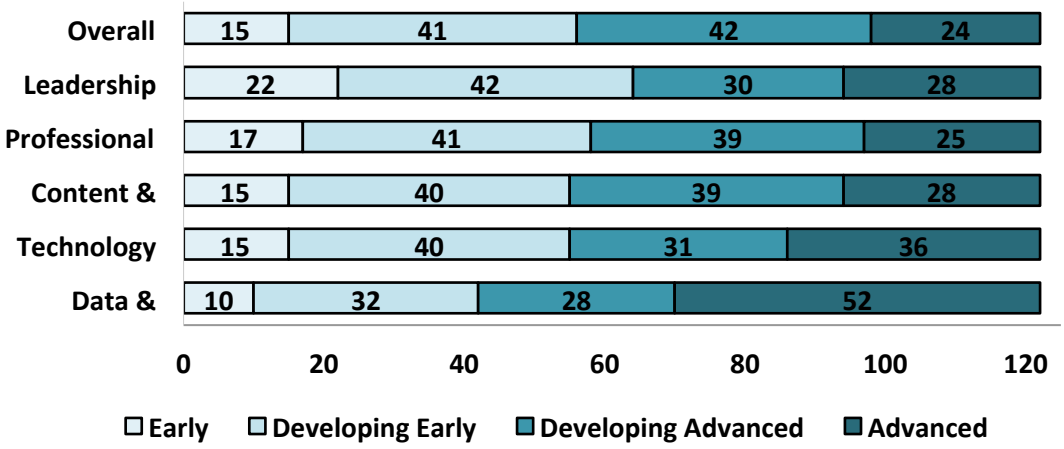

Figure 7: Charter School Self-Assessment Data Overall and by Area

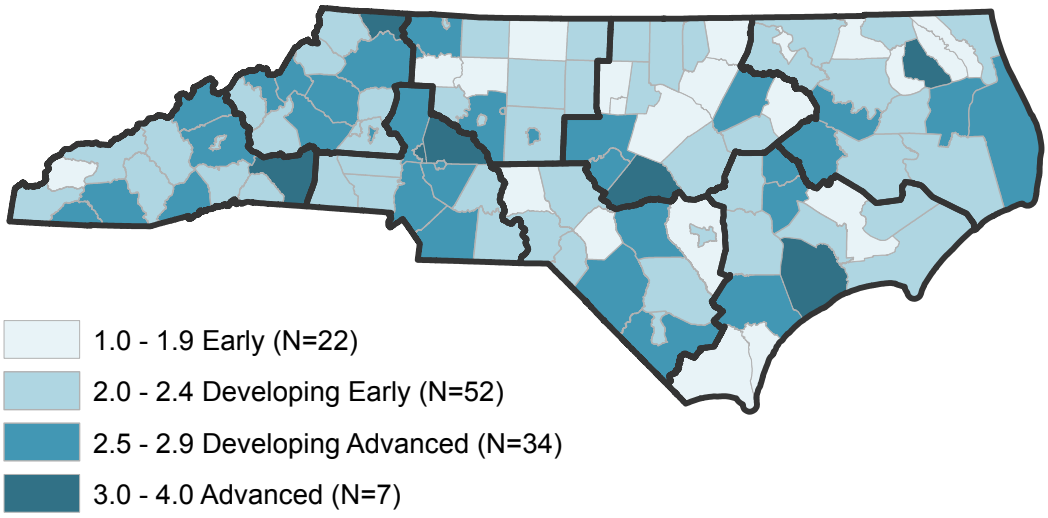

Figure 8: Digital Learning Progress District Overall Self-Assessment Results

District and charter school leadership teams identified that they need support to develop and plan for the implementation of digital learning based upon their readiness, as documented in the NC Digital Learning Progress Rubric, and building upon the assets, context, and resources available in their schools. The results of the Rubric highlight specific areas in which districts and charter schools need to develop more in-depth understanding of strategies to move their schools forward, as well as potential models for how to best implement digital learning. These supports need to be targeted to the needs of the individual district or school, since each begins in a different place and progress on different dimensions of the rubric varies widely.

The following sections of the Digital Learning Plan provide the statewide data for each category of the Rubric for LEAs and charter schools. They also provide major findings informed by data from LEA and charter school site visits; teacher-, school-, and district-level surveys; interviews with educators, parents, and students; analyses of state systems and policies; and research conducted both in North Carolina and nationally. The analysis, conducted over the past year, has led to the following guiding principles, five-year goals, and recommendations for how the state can support the transition to effective digital-age teaching and learning throughout North Carolina.

Guiding Principles

We recommend that the statewide work to advance the Digital Learning Plan be guided by the following core principles:

1. Focus on teaching and learning

The focus of the North Carolina Digital Learning Plan is on effective teaching and successful learning, enabled and enhanced by technology. While digital devices, Internet connectivity, software, and supporting technologies (e.g., projectors, printers, cameras) are necessary for digital learning, simply making the technology available is not sufficient; the primary goal is employing the technology to increase students' engagement and learning. The Digital Learning Plan sets forth recommendations for

how the state can address the multiple areas North Carolina must address in order to move all of its public schools forward toward a digital-age learning model.

2. *Leverage existing innovations, expertise, and resources from throughout North Carolina, while also building upon national and international promising practices, models, and research.*

As described above, the transition to digital-age learning already has begun in North Carolina. This is also true across the United States and internationally. The data collection and research conducted as a part of the Digital Learning Plan identified exemplars of schools and districts that are demonstrating effective implementation across the country and internationally. State-by-state research on policies critical for digital learning and approaches to programs for implementation informed the recommendations in this Digital Learning Plan. The results of the state research were shared in a report developed by the Friday Institute and the State Educational Technology Association, *State Digital Learning Exemplars*.[4] Interviews with digital learning leaders from states such as Indiana, Kentucky, and Alabama, led to in-depth look at several efforts, such as planning and innovation grant approaches, innovation zones, and district support for data privacy. State- and district-level examples—such as competency-based learning in New Hampshire and Ohio, project-based learning areas of focus in Talladega, Alabama, and state-wide approaches with devices in Maine—contributed to the development of the overall vision for digital learning. International examples led to questions about the roles of educators and professional learning for educators to support the culture and instruction needed for digital learning to be effective.

While international, national, and state research and programs informed the overall design and recommendations and will continue to contribute to the future work related to the Digital Learning Plan, a central principle of NCDLC will be to identify and leverage the exemplary approaches, expertise, research, and resources already in place across North Carolina to help improve education statewide. This work will involve collaborations with local education agencies and charter schools, colleges and universities, professional organizations, state agencies, informal education centers, and non-profit and private sector organizations throughout the state. It also will identify opportunities to spread lessons learned from successful school and district programs to others throughout the state and foster opportunities for collaborations, both regionally and across statewide groups with common interests.

3. *Build leadership capacity throughout the state.*

Successful change in schools depends upon district- and school-level leadership: superintendents and central office staff; principals and curriculum, professional development, and technology leaders; and lead teachers. As described in this Plan, regional support structures also are needed, and their leadership and the expertise they provide is an essential part of the Plan. Therefore, a major focus of NCDLC during the next few years will be developing leadership at the school, district, regional, and state levels to build the capacity needed for long-term success.

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[4] Available online at http://www.setda.org/wp-content/uploads/2015/06/DigitalLearningExemplars_June2015.pdf.

4. ***Engage teachers, administrators, students, parents and other stakeholders***

NCDLC will be successful only to the extent that it impacts students' learning opportunities and experiences, which are the responsibility of local teachers and administrators, parents, and other members of the school community. Therefore, success requires support from local educators and all stakeholder groups; representatives of these groups need to be directly involved in planning and implementing NCDLC programs, and their input needs to inform the continuous improvement of those programs. In order for NCDLC to successfully foster innovation in North Carolina schools, the voices of those who will experience the day-to-day impact of changing educational practices must be heard throughout.

5. ***Focus on equity of educational opportunity for all students throughout North Carolina.***

When considering equity in digital learning, the focus often is on equity of access to digital devices and networking. While that is an essential component, what is most important is equity in students' educational opportunities and experiences, which depend upon their teachers' preparation and expertise. Equity in technology access is not sufficient without equity in the distribution of teachers who are prepared to engage their students in digital-age learning and have access to the curriculum resources required.

6. ***Plan for long-term sustainability, continuous improvement, and educational return on investment.***

The transition to digital learning will require changes in school, district, and state budgeting; teacher and administrator preparation and ongoing professional learning; curriculum standards and resources; school staffing; and other core aspects of our K-12 education system. That is, systemic changes will be necessary for digital learning to move beyond time-limited pilots and localized programs to statewide implementation. The Digital Learning Plan addresses initial steps to begin the statewide transition. Throughout the implementation of the Digital Learning Plan, ongoing analyses and updates will be required as the transition to digital-age learning proceeds, with an overall focus on ensuring long-term sustainability, continuous improvement, and educational return on investment.

Long-Term Goals

Our work to date has led to development of the following overall goals for the next five years. Progress at the pace required to meet these goals in five years is certainly feasible but will depend upon sufficient commitment and funding at both the state and local levels. NCDLC will help move the state's schools toward these goals as quickly as possible, given the funding and support that is available.

By school year 2019-20, North Carolina K-12 public schools through the state will have:

- Leaders in all districts and schools who have had opportunities for professional learning to prepare them to lead digital learning initiatives;
- Teachers in all classrooms who meet the digital learning competencies standards and are able to effectively apply digital-age approaches, tools, and resources to support their students' learning;

- Widespread application of personalized approaches that are enhanced by technology and that provide students and their parents with choice and voice in their educational experience;
- Well-designed, standards-aligned digital learning resources available for all subject areas and grade levels;
- A wide variety of course offerings, including online and blended courses, ranging from remedial to advanced placement, available to every student in every public school in the state;
- Digital tools to support communication, collaboration, critical problem solving, and creativity available to all students and educators;
- The networks, devices, and supports required to enable all students and educators to have ready access, both in and out of school, to the Internet and to digital resources to fully support digital learning activities;
- A plan and budget for maintaining and updating infrastructure and devices in an efficient and sustainable fashion;
- A well-designed system for handling the functions of student information management, curriculum management and planning, learning management, student formative and benchmark assessments, and educator evaluation; and
- Effective data systems that inform continuous improvement processes to ensure that digital learning approaches and resources remain effective and up-to-date.

Findings and Recommendations

The following sections describe the specific findings and recommendations for each of the areas shown in Figure 9:

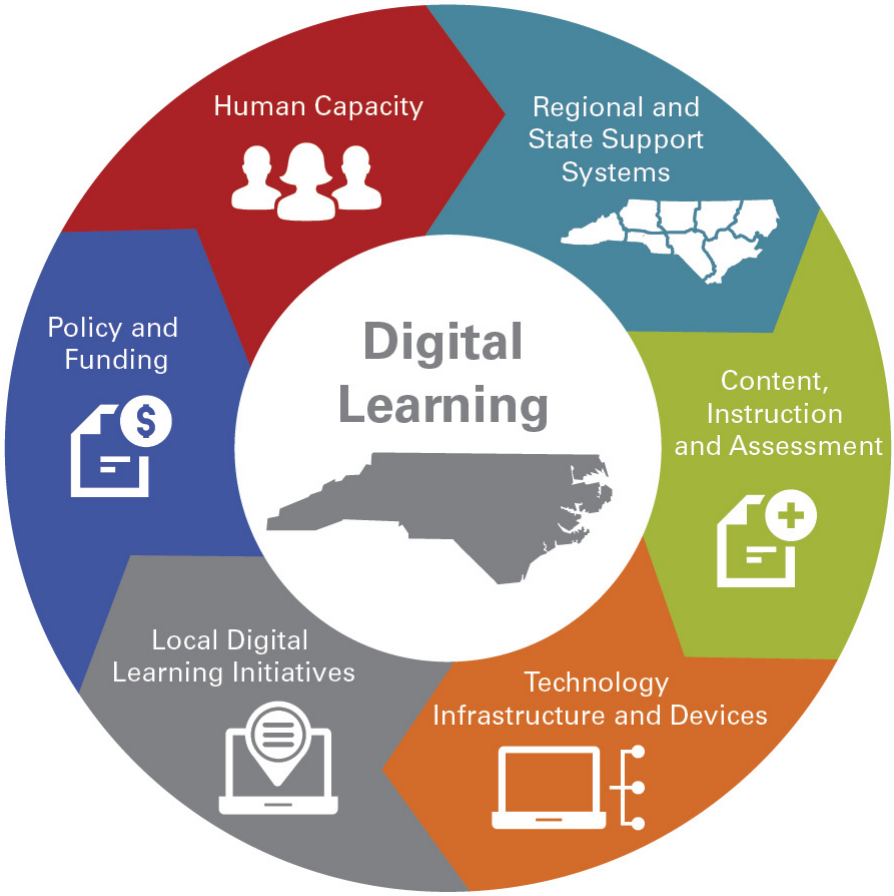

Figure 9: Areas of Findings and Recommendations

This Plan provides detailed rationale and action steps for each of the recommendations. Once the current legislative process is completed so that the final requirements and budgets for digital learning are determined, the Friday Institute, NCDPI, and other partners will prepare the final scope of work, schedule, and budgets to help move the digital learning transition forward in schools throughout North Carolina.

Table 2 summarizes the 21 major recommendations in the six areas. These recommendations are described in detail in subsequent sections, followed by a discussion of budget considerations. Additional background materials, data, and other resources are available on the NC Digital Learning Plan web site at http://ncdlplan.fi.ncsu.edu/.

I. TECHNOLOGY INFRASTRUCTURE AND DEVICES
Expand the School Connectivity Initiative to provide broadband access, internal networks, and related services to all schools.
Provide guidance to inform local decisions about purchasing networks, supporting infrastructure, and devices.
Establish a statewide cooperative procurement service for networks, devices, and digital content.
Participate in multi-agency efforts to provide broadband connectivity to all homes.
II. HUMAN CAPACITY
Develop and implement digital learning competencies for teachers and administrators as required by SL 2013-11.
Provide professional development for school and district leaders, instructional support staff, and technical staff.
Develop a network of professional development facilitators to prepare teachers for digital learning.
Guide teacher and administrator preparation programs to ensure that their graduates are ready for digital-age schools.
III. CONTENT, INSTRUCTION AND ASSESSMENT
Establish standards, review processes, and collaborative procurement for digital learning resources.
Support the use and sharing of high-quality open educational resources and teacher-created resources.
Provide tools that enable educators to use student data to improve student achievement.
Update Home Base tools and support systems to further meet the needs of educators, students, and parents.
IV. LOCAL DIGITAL LEARNING INNOVATIONS
Guide and support local leadership teams in planning and implementing digital learning initiatives.
Provide grants to support the development and dissemination of local innovative digital learning models.
V. POLICY AND FUNDING
Update State policies to provide the support and flexibility needed for local digital learning innovations.
Provide guidance to help educators address privacy, security, copyright, and responsible use issues.
Develop new State and local funding models to support and sustain digital-age learning.
Provide additional supports to ensure equity of digital learning opportunities for all students.
VI. REGIONAL AND STATE SUPPORT STRUCTURES
Establish the North Carolina Digital Learning Collaborative to manage the recommended State programs.
Establish regional digital learning networks to support digital learning initiatives and foster collaborations.
Implement a digital learning progress dashboard and data-informed continuous improvement processes.

Table 2: Digital Learning Plan Recommendations

TECHNOLOGY INFRASTRUCTURE AND DEVICES

An effective digital learning transition requires that students and teachers have reliable and consistent access to digital resources – providing equity of access across all LEAs and charter schools, small and large, rural and urban, economically sound and economically distressed. Access comprises the network infrastructure that brings Internet connectivity to LEAs, schools, and classrooms and the devices that provide an interactive interface to students and teachers. Ideally, every student and teacher should have access to a WiFi-enabled laptop or tablet to interact with digital resources, for communication and collaboration, and to create content. To ensure equity, access must be extended beyond the walls of the school and beyond the school day.

The infrastructure that brings Internet connectivity to LEAs, school buildings, and classrooms benefits from significant discounts provided through the FCC's E-rate program. E-rate provides discounts up to 90%[5] on eligible services including school fiber optic connections, Internet access, internal wiring, WiFi networks, data switching and routing equipment, and network security appliances (i.e., Firewalls). The NC School Connectivity Initiative (SCI) compliments the E-rate program in North Carolina by providing state funding to cover the non-discounted portion of school connectivity-related charges. The SCI also provides a statewide network connecting all LEAs and most charter schools to the Internet, E-rate training and support, and network engineering services. The primary connectivity challenge is providing adequate and sustainable network infrastructure inside of schools. A 2014 modernization of the E-rate program provides an opportunity to apply SCI program benefits to classroom level school connectivity, with additional state support. The Race to the Top grant funded NC Education Cloud program has developed identity and access management (IAM) and learning object repository (LOR) infrastructure to help connect students, teachers, and parents to online content – specifically, IAM provides a single user ID and password for accessing cloud-based digital resources and the LOR provides an infrastructure to aid in finding digital resources.

Findings

The following findings inform the technology infrastructure and devices recommendations.

1. In districts with successful digital learning initiatives, decisions about devices followed the development of a clear vision and plan for digital teaching and learning, so that the appropriate devices could be selected to implement a well-defined educational plan.
2. North Carolina has become nationally recognized as a leader in bringing broadband Internet access to all the schools, as a direct result of the School Connectivity Initiative (SCI), which provides a fiber connection to virtually every school in the state. Through this program, all school districts benefit with a consortium purchase of commodity Internet access, a shared common statewide backbone and associated support services provided by MCNC.

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[5] E-Rate program discounts are weighted primarily based on Free and Reduced Lunch (FRL) eligibility.

3. By leveraging the FCC E-Rate program and with an annual, recurring line item in the state's budget, all schools in North Carolina are afforded the same and equal opportunity to access Internet based learning resources. By combining the purchasing power of the entire state, all districts receive better pricing and service than they could obtain on their own.
4. While there has been substantial progress on Internet access to the schools, there is a long way to go in providing the internal Wi-Fi infrastructure throughout each school and the devices students and teachers need to support digital learning. Figure 10 shows the overall self-assessment results for LEAs on the technology infrastructure and devices items of the May 2105 NC Digital Learning Progress Rubric. Twelve LEAs rate themselves as at the advanced stage, while nearly twice that number, 22, rate themselves as at the early stage. Figure 11 shows the results for the 120 charter schools that completed the Rubric. Figure 12 shows the results by individual LEA.

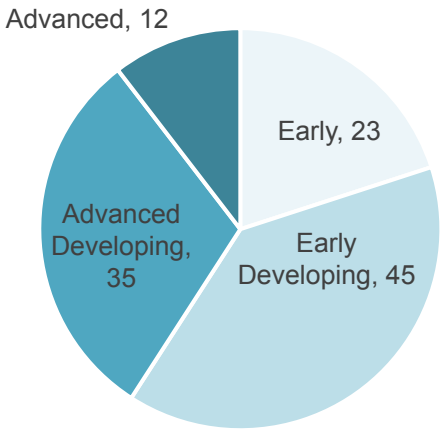

Figure 10: LEA Technology Infrastructure and Devices Self-Assessments

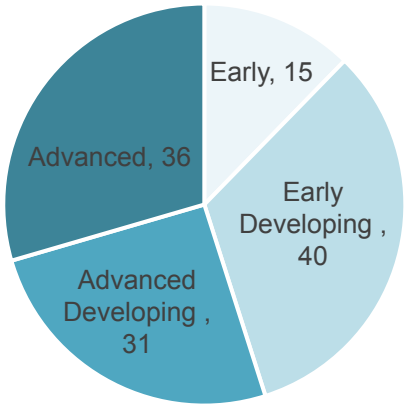

Figure 11: Charter School Technology Infrastructure and Devices Self-Assessments

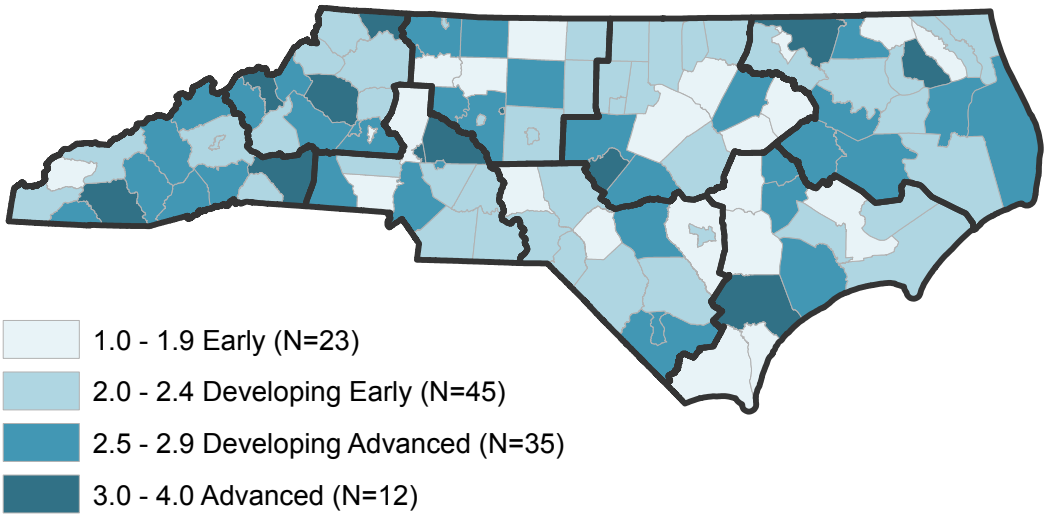

Figure 12: Technology Infrastructure and Devices Self-Assessments by LEA

5. Almost half (44%) of the schools in North Carolina have digital learning-ready wireless networks in place, double the number from just two years ago. During calendar year 2015, the number of schools with digital learning-ready wireless will move to above 60%, supported by over $8 million in Race to the Top and $32 million in Federal E-Rate funding.
6. According to the state's 2015 Annual Media and Technology Report (AMTR) survey, 688 schools representing 93 LEAs and 20 charter schools have 1:1 computing initiatives for at least some grades or schools. With the help of one-time Race to the Top local funds, many LEAs have added to or grown district-wide 1:1 programs, particularly in the last two years[6]. Still, only ten LEAs report having 1:1 programs in all schools[7] (see Figure 13) and few LEAs have sustainable district-wide 1:1 access – Mooresville Graded School District being a notable exception.

[6] In a survey of LEAs conducted in May 2013, the number of schools reporting 1:1 initiatives is less than half the number reported in the 2015 AMTR.
[7] Overall, about half of the schools in districts reporting 1:1 in all schools include 1:1 in all grades. Even the most progressive 1:1 districts do not support 1:1 in early elementary grades – most typically that means Pre-K through second grade.

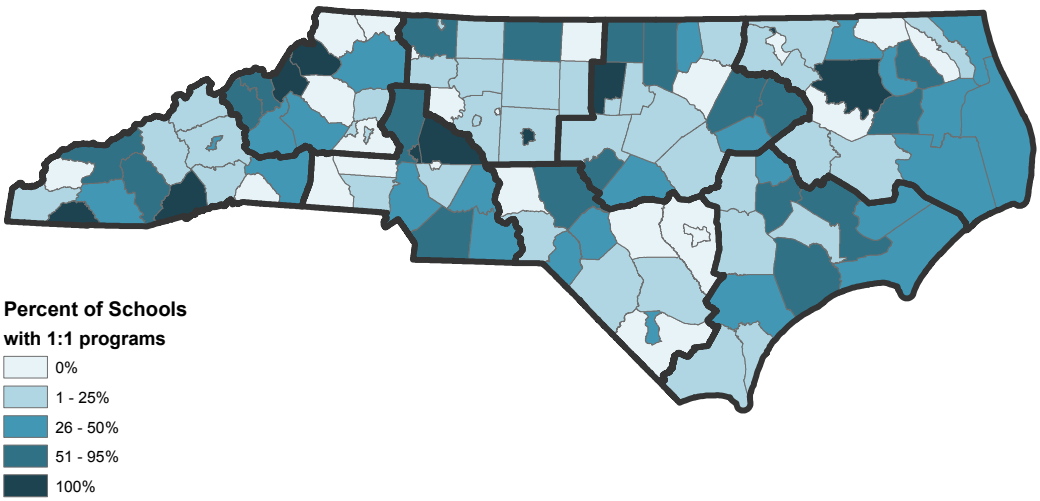

Figure 13: Percentage of Schools with 1:1 Programs by District, as of June 2015

7. Some LEAs now support *bring your own device* (BYOD) initiatives. While a Wake County Public Schools pilot is looking to scale BYOD as part of a digital strategy, other BYOD initiatives essentially amount to providing guest WiFi access to students and teachers who may bring personal devices to school. While BYOD as guest access can enhance the number of devices in the classroom, BYOD as the model for a 1:1 program requires addressing the complexities of a heterogeneous computing environment and managing student access for those with no device to bring.
8. Though many districts and schools have infrastructure in place, some teachers and many students made complaints about WiFi connections being slow and unreliable.
9. LEAs and charter schools do not consistently have well-developed policies and processes for device selection, procurement, and management.
10. Digital learning environments require adequate and convenient power outlets for charging devices in classrooms and other educational spaces (e.g., school media centers); many schools struggle with providing adequate access to power outlets (because most schools were not built with these digital-age learning needs in mind).
11. Almost all districts and schools struggled to maintain sufficient, qualified personnel with expertise to support device and technology maintenance and infrastructure requests. One solution seen in a handful of districts involved utilizing students as help desk personnel to assist teachers and other students with troubleshooting and basic technology needs (students also received course credit for this role).
12. Similarly, school and district staff frequently reported the need for timely responses to technology-related requests; acquiring needed technical support personnel and putting into place more streamlined and efficient processes for handling requests may assist with providing more timely responses.
13. In many cases, instructional technology facilitators, coaches, or other instructional personnel are being asked to complete technical support requests -- putting a strain on their ability to provide support for educators' instructional needs and student learning.

14. According to 2015 AMTR data, 25% of schools report that less than half of their students have access to the Internet at home. Though some districts have attempted to address the need by assisting with access through providing or encouraging use of alternative wireless access points throughout their communities (e.g., public libraries, main street hotspots, school buses parked in neighborhoods, fast food and restaurant options), home access is still a major need in terms of equity.

Recommendations

The recommendations and goals, based upon the above findings, for continued progress on technology infrastructure and devices in K-12 schools are summarized in Table 3 and described in more detail below.

Recommendations	Goals
• Expand the School Connectivity Initiative to provide and support broadband access, internal networks, and related services to all schools, while planning for increased bandwidth demands, replacement of outdated equipment, increased network engineering support, and ongoing funding.	• All schools have sufficient network capacity to fully support digital learning in all classrooms and workspaces by 2018. • Sustainable funding and processes are available to maintain well-functioning networks in all schools thereafter.
• Provide guidance to inform local decision makers about purchasing networks, supporting infrastructure, and devices.	• Ongoing increases are found in (a) teachers' and students' ratings about their access to technologies, and (b) the number of schools that provide devices to every student.
• Establish a statewide cooperative procurement service for networks, devices, and digital content.	• Cost savings are obtained through economies of scale purchasing for both equipment and digital content.
• Participate in multi-agency efforts to provide broadband access for all homes.	• All Districts are able to address community and home access to ensure digital resources are available to all students.

Table 3: Summary of Technology Infrastructure and Devices Recommendations and Goals

1. Expand the School Connectivity Initiative to provide and support broadband access, internal networks, and related services to all schools while planning for increased bandwidth demands, replacement of outdated equipment, increased network engineering support, and ongoing funding.

We recommend that the North Carolina continue the funding and use the model established within the School Connectivity initiative to procure Internet access for schools. We also recommend that this approach be expanded to also include the networks inside of school buildings, which, with the 2015 modernization of the FCC program, now qualify as eligible E-Rate expenses in every public school in North Carolina. The goals are for all schools to have: (a) sufficient network capacity to fully

support digital learning in all classrooms and workspaces by 2018; and (b) sustainable funding and processes to maintain well-functioning networks thereafter.

In 2015, North Carolina used Race to the Top grant funds to pilot a program similar to SCI, but with focus on the internal networks for school buildings. Specifically, the state sought to provide Wi-Fi access points and associated hardware to as many classrooms as possible. With the increased network demand that will result from widespread adoption of digital learning, the state must be prepared to invest in the network infrastructure to ensure continued network reliability and cost effective procurement.

In particular, we recommend the following to ensure that all North Carolina schools have sufficient and reliable Internet access to all classrooms and workspaces to fully support digital teaching and learning:

a. *Increase the annual funding commitment for the state backbone, Internet access and associated functions.*

As more and more applications are moved to remote servers, bandwidth demands will increase. Also, as the price of technology continues to decline, more students will have access to devices that they may use in every class, including high-bandwidth demand uses, such as viewing educational videos. Thus the number of users and the amount of usage per user will increase dramatically over the coming years. This demand will also affect the firewall and filtering capabilities required. Today, MCNC provides a cloud-based Internet filtering service, but the cost of that service will rise dramatically as the bandwidth increases. Services like this are fundamental to protecting students from objectionable and distracting content.

b. *Conduct a study of the current LEA wide area network[8] architectures to determine what changes can be made to provide maximum throughput at the lowest cost.*

Currently, each LEA aggregates all school connections to a single point, which then connects to the NCREN backbone. As usage patterns change, this design may prove inefficient and unscalable. LEAs, NCDPI and MCNC need to identify new architectures that could alleviate network bottlenecks while providing improved services as more content moves to the cloud.

c. *Fund internal school networks on an ongoing basis.*

The 2015 WiFi Expansion program, supported by Race to the Top and FCC E-Rate funding, appears to be an overwhelming success. Continuing to support internal school networks while optimizing the return from the E-Rate program will ensure all students have equal network access to digital learning resources, regardless of their geographic location in the state. Many of the principles of the School Connectivity Initiative can and should be applied to Wi-Fi networks.

[8] Wide area network (WAN) is the combination of connections and equipment between the schools and the central networking location within a district.

d. Implement a program to replace outdated equipment in the schools at a continual, predictable pace.

The expected lifetime of internal school network equipment is five to seven years. Therefore, funds for replacing equipment must be available to sustain digital learning transitions. A well-planned process to doing so will allow the state to continually evolve as technology progresses, while ensuring that technology funding is used with maximum effectiveness.

e. Expand the client network engineering (CNE) service provided by MCNC.

The CNE service has proven to be a valuable element of SCI sustainability – providing LEAs and charter schools with a professional engineering team to assess, document, and provide consulting services on network architecture, performance, security, configuration, and more. Supporting a sustainable internal network model requires a focused engineering team to keep up with the market and to support optimal internal network architectures and configurations.

f. Provide enhanced E-Rate consulting services to LEAs and charter schools.

We recommend that NCDPI issue a competitive bid for LEA E-Rate consulting support. With a competitive bid, LEAs can gain access to consistent, high quality, E-Rate support services under favorable terms that also benefits from economies of scale.

Action Steps and Metrics

	Year 1	Year 2
Action Steps	• Follow through on Race to the Top WiFi contracts and installations • Issue a consortium RFP for 2016 internal networks • Develop an allotment strategy for LEA E-Rate match • Re-budget and reconfigure school connectivity funding • Study WAN architectures and produce recommendations and • Develop a technical WiFi network performance analysis test plan • Prioritize LEAs for execution of the test plan in at least 30 LEAs • Work with the FCC on optimizations around state-level bundled Internet services consortium procurement • Develop a strategy to limit the negative effects of the E-Rate phasing out of voice services	• Issue a consortium RFP for 2016 LEA and charter school internal networks • Study E-Rate consultant market • Study LEA E-Rate consultant usage and costs • Develop a cooperative purchasing RFP for LEA E-Rate consulting • Adjust LEA allotment strategy based on E-Rate rules changes • Coordinate with the FCC on NC-specific E-Rate rules adjustments • Partner with the FCC on home access linked to school networks • Work with LEAs and NCITS to optimize voice service solutions – including through the issuance of an RFP or managed voice over IP services • Collaborate with the office of digital infrastructure on home access strategies
Metrics	• 60% of schools with digital ready WiFi • 30 LEA CNE engagements	• 80% of schools with digital ready WiFi • 30 LEA CNE engagements

2. Provide guidance to inform local decision makers about purchasing networks, supporting infrastructure, and devices.

While decisions about devices are made at the local level, schools and districts may not have the expertise to make informed choices that will optimize the use of their funding long-term. For example, they may select networking equipment based on cost, and then find it is out-of-date very quickly. Or they may select devices and then find that they are not useable for secure state testing. To help local decision-makers, we recommend the following to support ongoing increases in (a) teachers' and students' ratings about their access to technologies, and (b) the number of schools that provide devices to every student:

a. *Provide guidance to enable LEAs and charter schools to conduct a gap analysis between their current device availability and that needed for the full use of digital learning.*

Each LEA and charter school will need to align their analysis with the instructional vision and goals, in order to make informed decisions about technology purchases. They will also need to understand use cases including: challenges with bring your own device (BYOD) approaches; home use versus school day use only; pluses and minuses of tablets versus laptops versus Chromebooks; and differences in requirements and usage by lower elementary, upper elementary, middle school and high school. Guidance for cost analyses will also be required. Furthermore, special requirements for CTE, EC, Advanced Classes, AP, STEM and other demanding cases will need to be included in the analyses.

b. Provide guidelines for the selection of digital devices for students and teachers.

While there are some clear requirements, such as having the capacity for online testing, there are also many other considerations. These include, but are not limited to: minimum screen size and resolution, audio and video input and output, input devices, Wi-Fi standards, solid state drive versus spinning hard drive, volatile and nonvolatile memory size, number and type of USB ports, operating system, durability, reliability, compatibility with existing systems, compatibility with desired software, and existing LEA staff knowledge. Other issues that are essential to consider when procuring devices include: mobile device management and asset tracking, help desk/repair management, cases/protection, disk imaging service, deployment, and antivirus and security systems. Any volume contract should also enable the state to specify exactly what software, if any, is pre-loaded on systems. Commercial off-the-shelf systems are often pre-loaded with software that is not appropriate for a classroom environment.

c. Update School Technology Infrastructure Planning Guidelines[9]

These guidelines should be developed and maintained by NCDPI's technology infrastructure organization in partnership with leading LEA technology directors, NCOITS, MCNC, and The Friday Institute. They should incorporate guidance related to wiring infrastructure standards, equipment powering and cooling, data communications, classroom presentation appliances, and device charging solutions. Dissemination and communication should be supported in the field through NCDPI's regional instructional technology staff.

[9] *School Technology Infrastructure Planning Guidelines* were last updated in 2006.

Action Steps and Metrics

	Year 1	Year 2
Action Steps	• Establish a device working group that includes district, school, NCDPI, MCNC, and Friday Institute representatives • Develop gap analysis tool based on the DL Progress Rubric and related data sources • Facilitate development of device guidelines through the working group • Formalize device modeling and TCO tool developed as part of the DL planning process • Establish technology infrastructure working group to edit School Technology Planning Guidelines • Publish modified infrastructure guidelines	• Support development of LEA plans to address identified gaps • Update device guidance tool based on market changes and lessons learned • Establish a process to revisit technology infrastructure guidelines on a regular basis
Metrics	• Gap analysis completed for all LEAs • Device guidance tool available to LEAs and charter schools • Technology infrastructure document available to all LEAs and charter schools	• At least 1/4 of LEAs with identified gaps have a plan in place • Version 2 device guidance tool available to LEAs and charter schools

3. Establish a statewide cooperative procurement service for networks, devices, and digital content.

Significant knowledge and insight regarding technology procurement in public schools has been obtained over recent years through the School Connectivity Initiative. We recommend that the state use a similar process and methodology for the procurement of student learning devices and digital education content. Just as collaborative procurement for Internet services has proven cost effective and increases equity among the districts, so too can an operationalized program for the ongoing and sustainable procurement of learning systems. The procedures established by the Textbook Warehouse also inform the following specific recommendations, and the Warehouse may play a role in implementing them. The goal is to obtain cost savings through economies of scale in purchasing for both equipment and digital content.

At a high level, such a program would require the following steps, including a feedback cycle each year that allows for continuous improvement in the procurement process. NCDLC will work with the districts and schools, appropriate state agencies, and vendors to accomplish the following:

- Obtain information about current use cases, available technology, budget and aspirations with respect to digital learning at each school and LEA. Ideally, this would be supported, in part, by an updated data collection and reporting capability.
- Research and survey of the device market yearly, and understand industry trends. Additional research of educational software, platforms, and content is required. This includes, but is not limited to, widely used software platforms such as Flash, Java, Silverlight, Google Apps for Education and Microsoft 365, as well as educational content.
- Identify affinity groups among the LEAs and charter schools so that demand and resources can be pooled, while still providing the LEAs choice and flexibility in their approach to digital learning. LEAs and charter schools with similar installed bases of technology can cooperate to find the best alternatives to attaining their personalized learning goals. NCDLC will provide a framework whereby LEAs and schools can easily identify others with similar situations and goals so that cooperation can take place.
- Develop statewide RFPs for digital devices, including Windows and Apple laptops, Chromebooks, and tablets. These RFPs could result in convenience contracts, one-time buys or a combination of both. The state should work to ensure a small number of model numbers are selected across each category as to maximize volume, obtain the best price, and reduce the support burden and spare parts requirements. For example, a single RFP might be used to procure Chromebooks and Windows laptops, to aggregate volume to a smaller number of vendors and thus drive the price down. It may also make sense to pick two devices from each vendor, for example a price-optimized model and a function-optimized model.
- Maintain statistics regarding durability, longevity, service issues, etc. for devices and use in the RFP specifications process for subsequent years.
- Investigate programs that encourage good online citizenship and the proper maintenance of the devices for the duration of the time the student uses a school-owned device. For example, some districts have experimented with allowing students to keep devices over the summer break. Others have suggested allowing the student to purchase the device for a nominal residual value upon graduation. The efficacy of these strategies to encourage care is taken with devices should be analyzed and shared with all LEAs.

NCDLC will also coordinate similar procurement strategies for other digital learning technology, for example: Classroom teaching devices (such as Mondopad, Smartboard, Promethean, Mimio, etc.), Raspberry Pi and Linux “terminals” for testing, as well as other technology that is frequently used in classrooms. By consolidating procurement, compatibility of software and content is eased and prices are driven down.

Action Steps and Metrics

	Year 1	Year 2
Action Steps	• Define specifications for a modernized AMTR data collection and reporting function • Develop AMTR tool for collecting and reporting on device data • Collect device data and related procurement needs from LEAs and charter schools • Research the device marketplace • Assemble LEA technology leaders to develop overall device procurement strategy • Develop device RFP(s) to procure Windows laptops, Chromebooks, Android tablets, Windows tablets • Develop an Apple single source strategy for bulk purchasing of laptops and iPads	• Add appliance and classroom peripheral categories to modernized AMTR tool • Deploy modernized AMTR such that LEAs, NCDPI, NCDLC, and others can access local and state level data • Research classroom technology peripheral marketplace – including displays and interactive technology • Assemble LEA technology leaders to develop peripherals procurement strategy • Develop peripheral RFP(s) • Collect data from 2015 device RFP and adjust the process and RFP as needed • Amend contracts as necessary
Metrics	• Report on 1:1 device data – by vendor and type for all LEAs and in aggregate • Vendor contracts in place for Windows laptops, Chromebooks, and tablets • Bulk purchasing agreement for Apple devices	• Modernized AMTR tool accessible by all LEAs and charter schools, NCDPI, and NCDLC • Vendor contracts in place for classroom peripherals

4. Participate in multi-agency efforts to provide broadband access for all homes.

As schools transition to more use of digital resources and tools, students without home access will be increasingly disadvantaged, resulting in a serious lack of equity in educational opportunities. In the near term, schools are using caching technology (so students can download what they need before leaving school) and careful selection of content that allows "offline" usage to help alleviate the problem, but a long term solution is needed both for families that cannot afford Internet access and families in remote areas in which Internet access if not available. This issue of universal home access to the Internet is also critical to the community college and university systems, as well as many other government services.

It is vitally important that LEAs cooperate with county agencies, public safety networks, community colleges, libraries, and other community anchors to ensure the maximum network coverage for the communities that the schools serve. No single government

entity will be able to solve the remote residential broadband challenge, but by pooling resources, communities can work together to maximum opportunities for public school students as well as other residents of the communities in the difficult to reach locations. At the state level, the Office of Digital Infrastructure is charged with providing for better coordination and resource sharing across state agencies around broadband and digital infrastructure. The newly created office reports to the state Chief Information Officer and incorporates the former Department of Commerce NC Broadband organization and the FirstNet wireless network for first responders. NCDPI's School Connectivity Initiative team has engaged with Office of Digital Infrastructure and we recommend that NCDPI and NCDLC play an active role with the Office moving forward.

HUMAN CAPACITY

The digital learning transition requires that teachers and administrators are able to take full advantage of modern technologies. While many educators have participated in professional learning programs to gain expertise in digital learning, the statewide data described below show that much remains to be done to update the North Carolina education workforce.

Findings

The following findings inform our human capacity recommendations:

1. Leading digital learning transitions presents new challenges for school and district leaders and many do not feel well prepared for all the challenges involved. For example, they are looking to better understand models of effective digital teaching and learning, how to evaluate teachers' use of digital learning, and how to make informed decisions about technology infrastructure and devices. Figure 14 shows the number of LEAs that rated themselves at each level on digital learning leadership on the 2015 Digital Learning Progress Rubric: 25 rated themselves as early, and only 13 rated themselves as advanced. Figure 15 shows the same data for the 120 charter schools that completed the Rubric, of which only one rated itself as advanced. Figure 16 shows the digital learning leadership self-assessment rating for each LEA.

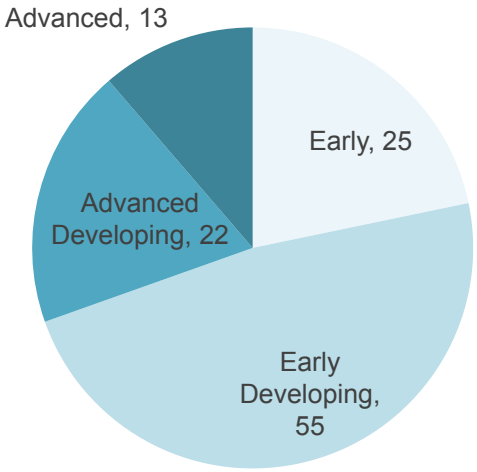

Figure 14: LEA Digital Learning Leadership Self-Assessment Ratings

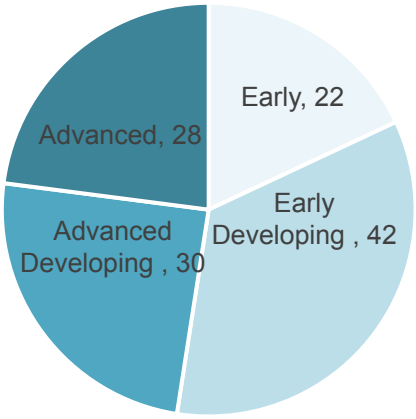

Figure 15: Charter School Digital Learning Leadership Self-Assessment Ratings

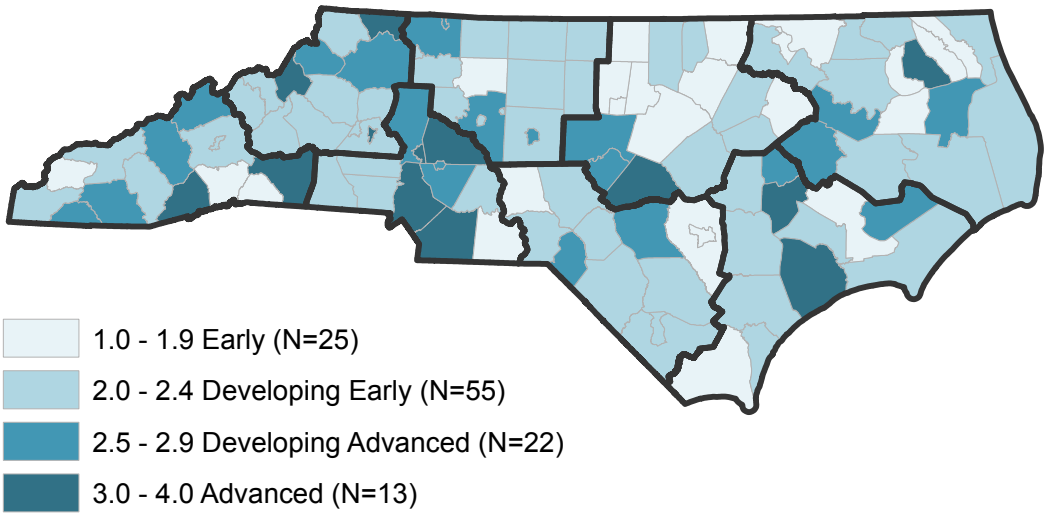

Figure 16: Digital Learning Leadership Self-Assessment Ratings by LEA

2. Most teachers in most districts report that that have not yet had sufficient training for technology use in their classrooms. On the 2014 Teacher Working Conditions Survey, in only six districts did more than 40% of the teachers rate themselves as having sufficient training to fully utilize instructional technology (Figure 17).

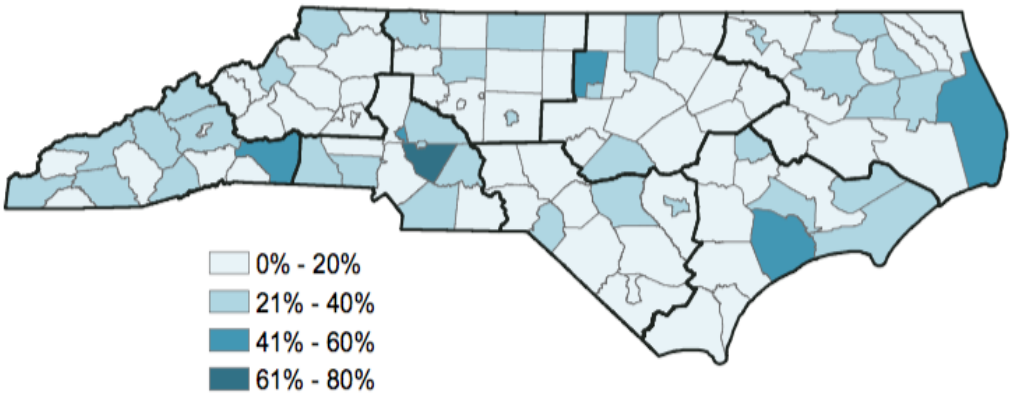

Figure 17: Proportion of Teachers Reporting Sufficient Training for Technology Use

3. Principals play critical roles in leading digital learning transitions, supporting the teachers and other staff through the transition, and engaging the support of the school community. Principals are seeking preparation and support for these roles.
4. Digital Learning Progress Rubric self-assessment data shows that few districts and charter schools rate themselves as advanced in the area of professional learning about digital-age teaching and learning; most feel they have a lot of progress to make in this area. Figure 18 shows the number of LEAs that rated themselves at each level on professional learning on the 2015 Digital Learning Progress Rubric. Figure 19 shows the same data for the 120 charter schools that completed the Rubric. Figure 20 shows the self-assessment rating for each LEA.

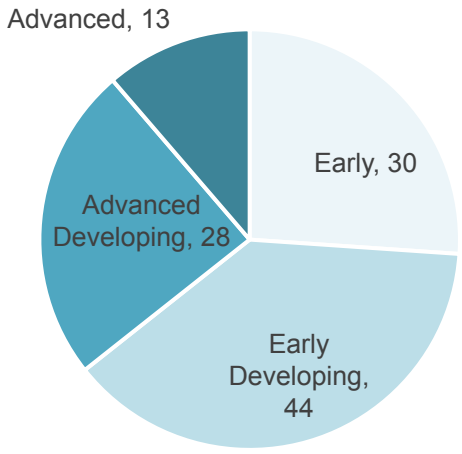

Figure 18: LEA Professional Learning Self-Assessment Ratings

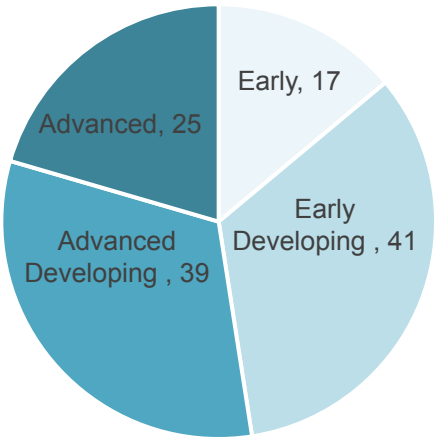

Figure 19: Charter School Professional Learning Self-Assessment Ratings

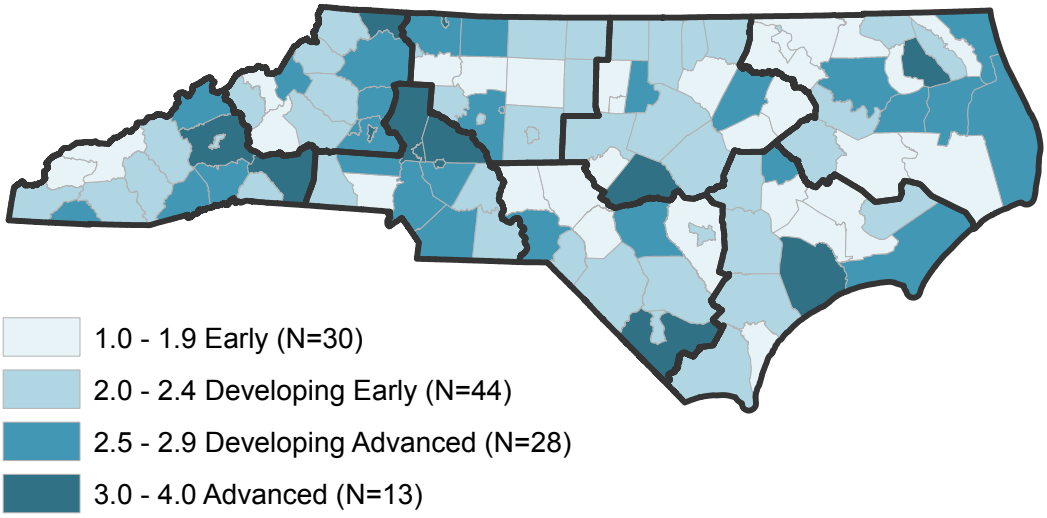

Figure 20: Professional Learning Self-Assessment Ratings by LEA

5. Teachers would like clarity about the expected digital learning competencies and how they will be evaluated. Similarly, administrators would like clarity about both the teacher digital learning competencies and those they will be expected to meet as administrators.
6. School-based Instructional Technology Facilitators (ITFs), Digital Learning Coaches and/or Media Coordinators with expertise in digital learning play essential roles in supporting teachers in their transition to digital learning. They provide model teaching, coaching, support for planning lessons and selecting digital resources, facilitations of professional learning groups, hands-on training, student activities and other supports. These individuals must have expertise in both instruction and technology, and many schools struggle to recruit and retain individuals who are well

prepared for this role. Additionally, many districts report that personnel in these positions spend more time supporting technology than instruction because of a lack of technical support services available within the school

7. Successful LEAs and schools incorporate ongoing professional development programs that are embedded in teachers' ongoing work; are differentiated to meet individual teachers' needs; enable teachers to experience being digital-age learners; and leverage professional learning communities.
8. Teachers note that districts need to be more strategic in designing and delivering professional training to avoid wasteful spending due to ineffective programs and redundancies in content, resources, or topics covered.
9. Successful districts are leveraging professional learning communities to support digital learning, resource sharing, and data use to inform continuous growth.
10. Almost all districts and schools struggled to maintain sufficient, qualified personnel with expertise to support device and technology maintenance and infrastructure requests.

Recommendations

The Human Capacity recommendations and goals, based upon the above findings, are summarized in Table 4 and described in more detail below.

Recommendations	Goals
• Develop and implement digital learning competencies for teachers and administrators as required by SL 2013-11.	• All teachers and administrators demonstrate understanding and application of the digital learning competencies.
• Provide professional development for school and district leaders, instructional support staff, and technical staff, in order to prepare local leadership teams to plan and implement successful digital learning initiatives.	• All teachers and students report effective leadership and support for digital learning in their districts and schools.
• Develop a network of professional development facilitators to prepare teachers for digital learning. Provide resources to support them in delivering face-to-face, online, and blended professional learning programs for teachers of all content areas and levels.	• All teachers report that they are prepared to effectively use digital learning to increase their students' engagement and achievement. • All students report that their teachers use technology effectively to enhance learning.
• Guide teacher and administrator preparation programs to ensure that their graduates are ready for digital-age schools.	• Superintendents, principals, experienced teachers and students report that new teachers and administrators are well prepared for their roles as digital-age educators.

Table 4: Summary of Human Capacity Recommendations and Goals

1. Develop and implement digital learning competencies for teachers and administrators as required by SL 2013-11.

Teachers need to be well prepared in their own knowledge of the content they will teach and their understanding of learning processes and pedagogical approaches. They also need classroom experience with support from mentoring from experienced educators. That has not changed. However, another dimension has now been added, the uses of technology to enhance and extend students' learning, tied to the elements of digital-age learning summarized in Figure 1 on page 2 in the Introduction. Similarly, school principals need to be knowledgeable about digital learning and the changes required in teaching approaches, curriculum resources, school staffing, technology infrastructure, and other aspects of successful digital learning initiatives.

NC SL 2013-11 calls for the State Board of Education to develop and implement digital teaching and learning standards for teachers and school administrators by July 2017. Defining and implementing a set of Digital Learning Competencies for all teachers and administrators represents a critical step in formalizing digital learning as core competencies for educators. It is imperative that the Digital Learning Competencies are fully integrated into all initial educator preparation programs as well as ongoing professional development, including through licensure and re-licensure. Thoughtful development of the Digital Learning Competencies, ensuring the final competencies are realistic, actionable, measurable and provide meaningful guidance for educators, is critical. The long-term goal is for all teachers and administrators to demonstrate understanding and application of the digital learning competencies.

This work is in progress at NCDPI, with a plan to use proficiency-based measures that enable educators to demonstrate they have the required competencies, rather than just requiring that they complete specific courses or professional learning experiences. These competencies, when incorporated into teacher licensure and re-licensure requirements, will drive changes in teacher and administrator preparation, evaluation and professional development.

These digital learning competencies will be further developed during the fall of 2015 with the intent of integrating them into policies and practice through pilots during the 2015-16 school year and then more broadly during 2016-17.

Action Steps and Metrics

	Year 1	Year 2
Action Steps	• Develop and finalize digital learning competencies for teachers and administrators • Create recommendations for policy changes or additional guidance to incorporate digital learning competencies into licensure and re-licensure • Secure pilots for implementing the digital learning competencies through competency-based approaches • Create PD to build the capacity of teacher leaders/digital coaches/ ITFs to promote job embedded Professional Development based on DLC Toolkit for teachers	• Develop recommendations for evidence of the digital learning competencies that align with teacher and administrator evaluation instruments in a *Building Digital Learning Competencies Toolkit* • Utilize findings from the pilots and design a larger scale program for competency-based approaches to the digital learning competencies • Launch and host PD events across the state on effective use of toolkit to support competencies
Metrics	• Digital learning competencies are finalized • State policies for licensure and licensure renewal for educators and administrators reflect the competencies • At least one or two districts are piloting competency-based approaches for teachers and administrators working to achieve the competencies	• Evaluation instruments include "look -fors" that align to the competencies and provide specific details on what the competencies mean and do not mean • More districts are implementing competency-based professional learning opportunities • PD events to support the effective use of *Digital Learning Competencies Toolkit* to support competencies are hosted across state • At least 10 districts are engaged in competency-based approaches for teachers and administrators working to achieve the competencies • Competency-based options are more readily available for all districts

2. *Provide professional development for school and district leaders, instructional support staff, and technical staff.*

Our work in preparing this Plan identified district superintendents, school leaders, and instructional technology facilitators as critical to successful district and school digital learning transitions. The essential roles of technical staff in ensuring reliable network access and well-functioning equipment was also clear. We therefore recommend that NCDLC emphasize professional learning for educators in leadership roles; those who support teachers to effectively use digital learning with their students; and technical staff working in schools. This will build upon work already underway with programs provided by the principals and superintendents' associations, the Friday Institute, MCNC, the Golden Leaf Foundation, and the North Carolina Department of Public Instruction. The goal is to improve the effectiveness of leadership and support for digital learning in districts and schools. The specific recommended programs are described below.

a. District superintendents program

Superintendents are critical participants in the district planning team workshops identified above, but they also need an opportunity to build and expand their own capacity for leadership of the digital learning transition. The recommended program for superintendents is based upon one currently being developed by the North Carolina School Superintendents Association, the Washington D.C. based Consortium of School Networking (CoSN), and the Friday Institute. Initial planning for this program involves superintendents having a minimum of four face-to-face days in the first year to delve into topics related to their own leadership and the specific results of the Digital Learning Readiness Rubric utilized in the plan. The blended experience brings approximately 30 Superintendents together to collaborate and learn from one another while continuing to work on their own plans for their districts, as well as an opportunity to bring two or three key leaders from their district for part of the program. Topics include the Rubric areas aligned to CoSN's *Five Imperatives for Technology Leadership*:

- Leadership and communication
- Raising the bar with rigorous, transformative, and innovative tools for digital leaders
- Transforming pedagogy with compelling learning environments
- Supporting professional development and developing professional learning networks
- Creating balanced assignments

Ideally, the cohorts of superintendents would be able to continue to meet in person or virtually beyond the initial four days to continue the work and share lessons learned.

b. School principals program

The professional learning approach for current and future principals and charter school heads will build upon the resources and lessons learned from the *Distinguished Leadership in Practice for Digital Learning (DLP-DL)*, a Race to the Top supported program in which about 100 North Carolina principals participated in 2014-2015, and the *Leadership in Digital and Blended Learning* program, currently being piloted in seven sites across the country. Both were developed through a partnership of the Friday Institute and the North Carolina Principals and Assistant Principals Association

(NCPAPA). The more scalable approach, *Leadership in Digital and Blended Learning,* is implemented in a capacity-building, cohort-based learning community model with five blended sessions facilitated by local educators trained by the Friday Institute and NCPAPA to facilitate and customize the course for their local context. This model includes a shared platform for the online work between the local face-to-face sessions, opportunities for cohorts to learn and share online, and facilitation by the Friday Institute in conjunction with local leaders.

Principals in the program typically participate with cohorts of 25 to 50 peers. This blended approach includes five face-to-face eight-hour sessions and participation in online activities and collaboration between sessions. Topics include:

- Understanding Digital Learning
- Creating a Culture for Digital Learning
- Shifting Teaching and Learning
- Supporting Teachers Through Professional Learning
- Implementing and Sustaining Digital Learning

This program provides job-embedded, actionable professional learning and also facilitates building a cohesive community of principal participants. As a part of the program, principals develop their own action plan based upon their own readiness, needs, and context. Due to the number of principals in need of professional learning across the state, a regional or geographically-based approach with trained facilitators for each cohort will minimize travel time and costs, but still enable cross-district collaboration and sharing.

c. Instructional technology facilitators and other digital learning coaches program

Data from the site visits overwhelmingly validated the critical role that Instructional Technology Facilitators (ITFs), instructional coaches, media specialists, and teacher leaders play in the effective implementation of the digital learning transition, along with the significant need for professional learning to maximize the potential of these roles. ITFs or coaches are school-based personnel with expertise in instruction, curriculum, and digital learning who work directly with teachers, providing coaching, modeling and co-teaching; helping teachers identify digital resources and plan digital learning lessons; facilitating professional learning teams; and providing other supports to teachers as they transition to digital-age approaches.

The program recommended for the school and district digital learning coaches, including ITFs, media specialists, and lead teachers builds upon current work with a cadre of individuals in these roles in North Carolina funded partly through Project Tomorrow and facilitated by the Friday Institute and NCDPI's Digital Teaching and Learning Team's work to support ITFs throughout the state. The *Digital Leaders Coaching Network* should provide a blended opportunity that builds upon research on effective professional learning to provide instructional technology facilitators, coaches, mentor teachers, and library media coordinators access to personalized and ongoing opportunities. The program is aligned to the North Carolina Media Coordinator, Instructional Technology Facilitator and Coaching Evaluation Instruments and Standards.

It is centered around pedagogy and digital learning with a significant emphasis on strategies that enable coaches to apply that knowledge to building capacity among educators, administrators, and students in the school. The program would include:

- *Face-to-Face Convenings* through a year-long, program with a cohort of approximately 50 peers from across North Carolina to provide professional networking and collaboration within a sustainable community for the sharing of ideas and strategies. This will include ongoing interaction with experts through convenings held approximately each quarter planned to coincide with other opportunities, such as the annual NCTIES conference.
- *Cross District Strategic Solutions Protocol* with opportunities for ITFs, media coordinators, and lead teachers to participate in this virtual problem-solving approach to collaborate across districts and address challenges and opportunities within their buildings.
- *Coaching Digital Learning MOOC-Ed* with specific activities blended with and anchored by the face-to-face convenings. The *Coaching Digital Learning MOOC-Ed* is designed to support those individuals in schools who coach educators to create digital learning environments. Individuals who play this role are instrumental in cultivating a digital learning culture within their school, district and/or state. This course allows participants to learn along with their colleagues from other schools and districts to enhance digital learning content knowledge and further develop coaching strategies. During this self-directed, peer-supported, MOOC-Ed participants will:
    - Deepen their understanding of how to coach others to integrate technology effectively;
    - Explore relevant frameworks, strategies, tools, and resources to advance their digital learning coaching efforts;
    - Experience multiple opportunities for personalized application of their new learning and job-embedded practice; and
    - Develop and share a Coaching Action Plan to support their school/district's digital learning culture.

d. Technology directors and technical support personnel program

Many districts and schools shared the challenges related to recruiting and retaining qualified technology directors and technology support personnel. This includes being able to attract qualified people for these roles considering the competition of salaries and opportunities offered in industry or the rural nature of many of the districts. One program emerged as helping districts in having qualified individuals in the technology director role. Established through the School Connectivity Initiative, the Certified Education Chief Technology Officer (CECTO) program has been leading the way in establishing the core competencies IT leaders need in a modern education environment. Since 2010, NCDPI, MCNC, and the UNC School of Government's Center for Public Technology have collaborated to train five cohorts of leaders and chief technology officers[10]. The NCDLC will work with the CECTO program and with existing providers of technicians and school-based technology directors to gain an understanding of the needs and opportunities to ensure that qualified individuals are available for schools seeking to hire individuals for these roles who are able to readily support digital learning efforts. This could include development of initiatives or ways for districts to connect with programs that produce individuals with the qualifications necessary for these roles. Additionally, professional

[10] Information on the CECTO program can be found on the MCNC site and the UNC SOG site.

learning opportunities will be developed or tapped into for people in these positions to ensure they have the knowledge and skills needed to effectively and efficiently support teachers and students in their work. Ensuring that districts recognize the importance of having competent people in these roles and what that means will be a part of this work.

Action Steps and Metrics

	Year 1	Year 2
Action Steps	• Provide ongoing, blended opportunities for superintendents from at least 1/3 of the districts in the state • Provide ongoing, blended opportunities for at least two principals from 80% of the districts and one principal from at least 1/3 of the charter schools in the state • Provide ongoing, blended opportunities for at least 2 ITFs/media coordinators/instructional coaches from 80% of the districts and one ITF/media coordinator/instructional coach from at least 1/3 of the charter schools in the state • Provide the Coaching Digital Learning MOOC-Ed twice with a special focus on the NC cohort in the course (i.e. blended with ITF/media coordinator/instructional coach PD, host NC Twitter chat, develop PLC guides for NC participants) • Incorporate all of these professional learning opportunities into the NCDPI-managed PD course catalog – specifically, in the True North Logic Professional Learning System • Garner input from leaders of programs that produce individuals for technology directors and technology support personnel and districts that seek to hire individuals for these positions to gain an understanding of needs and preparation programs • Identify and create a plan for additional supports (policy or programmatic) and/or professional learning opportunities to ensure that individuals are prepared to fill the technology director and technology support roles in schools	• Provide ongoing, blended opportunities for superintendents from at least 1/3 of the districts in the state • Provide ongoing, blended opportunities for at least two principals from 80% of the districts and one principal from at least 1/3 of the charter schools in the state • Provide ongoing, blended opportunities for at least two ITFs/media coordinators/instructional coaches from 80% of the districts and one ITF/media coordinator/instructional coach from at least 1/3 of the charter schools in the state • Provide the Coaching Digital Learning MOOC-Ed twice with a special focus on the NC cohort in the course (i.e. blended with ITF/media coordinator/instructional coach PD, host NC Twitter chat, develop PLC guides for NC participants) • Implement the plan for additional supports (policy or programmatic) and/or professional learning opportunities to ensure that individuals are prepared to fill the technology director and technology support roles in schools

Metrics	• At least 1/3 of superintendents have participated in ongoing, blended professional learning opportunities • At least two principals from 80% of the districts and one principal from at least 1/3 of the charter schools in the state have participated in ongoing, blended professional learning opportunities • At least two ITFs/media coordinators/instructional coaches from 80% of the districts and one ITF/media coordinator/instructional coach from at least 1/3 of the charter schools in the state have participated in ongoing, blended professional learning opportunities • At least 250 ITFs/media coordinators/instructional coaches from NC participate in the Coaching DL MOOC-Ed • Based upon input from program and district leaders, the NCDLC has identified and created a plan for developing the supports and professional learning opportunities needed to ensure that LEAs and charter schools are able to hire qualified technology directors and technology support personnel	• At least 1/3 of superintendents have participated in ongoing, blended professional learning opportunities • At least two principals from 80% of the districts and one principal from at least 1/3 of the charter schools in the state have participated in ongoing, blended professional learning opportunities • At least two ITFs/media coordinators/instructional coaches from 80% of the districts and one ITF/media coordinator/instructional coach from at least 1/3 of the charter schools in the state have participated in ongoing, blended professional learning opportunities • At least 250 ITFs/media coordinators/instructional coaches from NC participate in the Coaching DL MOOC-Ed • Approximately 100 potential or current technology directors or school technology support personnel have participated in professional learning opportunities or other supporting activities • Policies recommended have been implemented

3. Develop a network of professional development facilitators to prepare teachers for digital learning.

A major challenge is to provide professional learning opportunities to prepare and support almost 100,000 North Carolina teachers to address the shifts in classroom practices, educational resources, student assessments, and educator competency required by the transition to digital learning. This will require support from the state level and major efforts at the regional, district and school levels. It will require scalable, cost-effective approaches, incorporating blended and online learning, train-the-trainer

approaches, and local professional learning communities. It will also involve providing resources to support the professional learning facilitators in delivering the multiple forms of professional learning for teachers of all content areas and grade levels. The long-term goals: (a) All teachers to report that they are prepared to effectively use digital learning to increase their students' engagement and achievement; and (b) All students have teachers who use technology effectively to enhance learning.

We recommend that the NCDLC provide the following to help build help capacity in the regions and districts to accelerate and support professional learning for teachers:

a. *Facilitator Training, Content, and Resources for those in districts, regions or organizations (e.g. NCCAT or NCTIES) that provide professional learning opportunities for teachers.*

The content and resources will be based upon research on effective professional development by Learning Forward and Linda Darling-Hammond, will build upon prior work of NCDPI's Educator Effectiveness initiatives and other organizations in the state, and will provide materials for the trained facilitators to use once back in the region or district. The NCDLC may also provide these leaders of professional learning with professional learning community (PLC) guides to be used with free, online learning opportunities. While instructional technology facilitators (ITFs), instructional coaches, and media coordinators may participate, this component focuses more on the content specifically and less on the coaching aspects of the work.

b. *Regional and District Cadres of innovators*

This component will be modeled after the successful programs launched in Nash-Rocky Mount Schools with Golden Leaf Foundation Funding. Teachers who are leading the charge in their schools on digital and personalized learning will be selected from each district and will participate in ongoing, blended learning opportunities and have the responsibility to take back and lead professional learning with other teachers in their district and school.

c. *Blended Professional Learning Series*

This professional learning series will consist of one-half or full-day experiences and virtual opportunities throughout the year for teachers across the state on a range of topics and content areas in central or regional locations. Districts can choose to have several teachers participate to help build momentum in their schools while specifically building the capacity of participating teachers. Topics will provide for personalization depending on the needs of each teacher and will work to help teachers build their own professional learning network.

Action Steps and Metrics

	Year 1	Year 2
Action Steps	• Develop and make available content, resources, and facilitator training for those who provide professional learning opportunities for educators in the LEA or charter school • Develop and implement a pilot cadre of innovators in two regions in the state • Develop and offer a centralized series of professional learning opportunities for educators	• Make available content, resources, and facilitator training for those who provide professional learning opportunities for educators in the LEA or charter school • Implement a cadre of innovators state-wide that builds upon the lessons learned and experiences of the pilot cadre • Offer a centralized series of professional learning opportunities for educators
Metrics	• Content and resources have been developed and an initial facilitator training has been held for professional learning providers reaching at least 20 districts and charter schools • Selection criteria and a pilot cadre of Teacher Innovators have been developed and started in two regions of the state • A Professional Learning Series has been developed and four sessions have been offered for at least two teachers in each of 60 LEAs or charter schools across the state	• Content and resources have been updated and facilitator training has been held for professional learning providers in at least 60 districts and charter schools • A cadre of Teacher Innovators is implemented across the state • A Professional Learning Series has been developed and sessions have been offered for an additional four educators in each of 120 LEAs or charter schools across the state

4. Guide teacher and administrator preparation programs to ensure that their graduates are ready for digital-age schools.

The research and data collected for the Digital Learning Plan emphasized the importance of ensuring that new teachers and administrators have the competencies needed to implement and lead digital learning. As the competencies are developed, NCDLC will work with teacher preparation programs and with the State Board of Education and NCDPI to do the following:

- Incorporate the digital learning competencies into licensure and re-licensure requirements to support schools in building and sustaining the human capacity, including teachers and administrators, needed to implement digital learning; include innovative IHE (Institutes of Higher Education)-LEA partnerships for teacher and administrator preparation as a possible focus for the innovative pilots described above;

- Explore professional learning opportunities for professors and engage faculty in job-embedded opportunities in schools, i.e. Higher Education-LEA partnerships focused on digital learning, so they can model effective practices;
- Provide IHEs with access to resources teachers will use in the their teaching positions (i.e. Home Base and other digital content), primarily by establishing partnerships with platform providers whereby licenses are granted for IHE use[11];
- Consider micro-credentials or alternative paths for achieving digital learning competencies; and
- Include exemplary pre-service programs in the Network to foster IHE-LEA collaborations and provide a means of sharing information across teacher preparation programs.

The overall goal of this effort is to update preparation programs so that superintendents, principals, experienced teachers and students report that new teachers and administrators are well prepared for their roles as digital-age educators.

[11] Ideally, NCDPI managed contracts will incorporate language requiring IHE instances to be provided and supported at no charge.

Action Steps and Metrics

	Year 1	Year 2
Action Steps	• Work with IHE and other preparation programs to incorporate the digital learning competencies and other resources used in teaching (i.e. HomeBase) into teacher and administrator preparation programs • Garner input from professors, other program leaders, LEAs, and charter schools on their needs to more fully incorporate the competencies into preparation programs, including lessons learned from exemplary programs • Develop professional learning opportunities for professors and implement the opportunities with an initial cohort of at least 20 professors or preparation program leaders • Explore possibilities of and develop initial plan for micro-credentials or other alternative paths for achieving competencies	• Continue to work with additional IHE and other preparation programs to incorporate the digital learning competencies and other resources used in teaching (i.e. HomeBase) into teacher and administrator preparation programs • Develop professional learning opportunities for professors and implement the opportunities with two additional cohorts of professors • Implement a pilot for micro-credentials or other alternative paths for achieving competencies
Metrics	• An initial cohort of professors across the state have gained an understanding of and begun to implement programs that help teacher attain the digital learning competencies and implement resources utilized by teachers once in practice • Professional learning opportunities have been developed and implemented for an initial cohort of 20 professors or preparation program leaders based upon input from professors, other preparation program leaders, LEAs, and charter schools • An initial plan for micro-credentials or other alternative pathways to demonstrating competencies has been developed	• Additional cohorts of professors across the state have gained an understanding of and begun to implement programs that help teacher attain the digital learning competencies and implement resources utilized by teachers once in practice • Professional learning opportunities have been implemented with at least two additional cohorts of professors and preparation program leaders • A pilot program for micro-credentials or other alternative, competency-based pathways to demonstrate mastery of the competencies has been developed

CONTENT, INSTRUCTION AND ASSESSMENT

Digital learning requires very different tools and resources than traditional learning. Curriculum resources are no longer static pages, but instead provide interactive, multimedia learning experiences, with embedded assessments of progress and personalized paths to learning. Instruction is more personalized, with students having the resources to learn on their own, in small groups, as well as from teachers in whole class settings. Assessments can be embedded in learning activities and inform teachers' real-time instructional decisions and, in online activities, can be used to set appropriate content and levels of challenge for students. All of these changes impact how teachers and students use curriculum resources, and how these resources are selected, created, shared and delivered. Findings and recommendations about digital-age content, instruction and assessment follow.

Findings

1. The self-assessment ratings on the content and instruction questions in the NC Digital Learning Progress Rubric are shown in Figure 21 for LEAs and Figure 22 for charter schools. Figure 23 shows the self-assessment ratings category for each LEA. As in the other categories, most districts, 84 in total, rate themselves as being at the early or early developing stages of progress in the use of digital content and instruction.

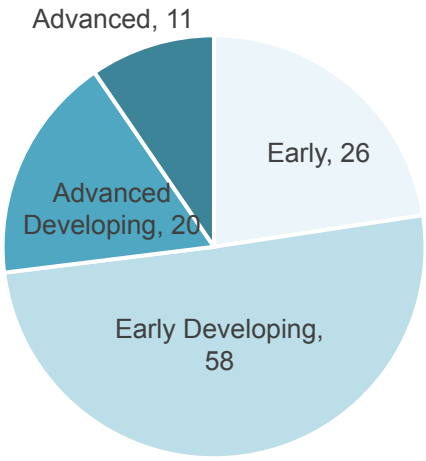

Figure 21: LEA Content and Instruction Self-Assessment Ratings

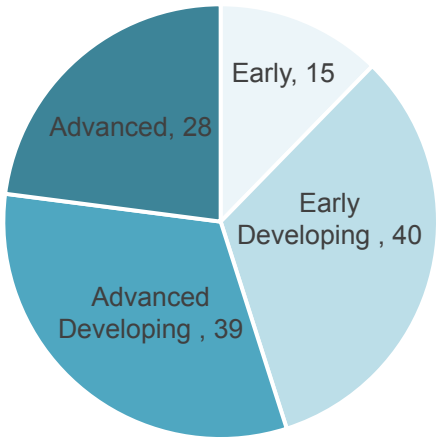

Figure 22: Charter School Content and Instruction Self-Assessment Ratings

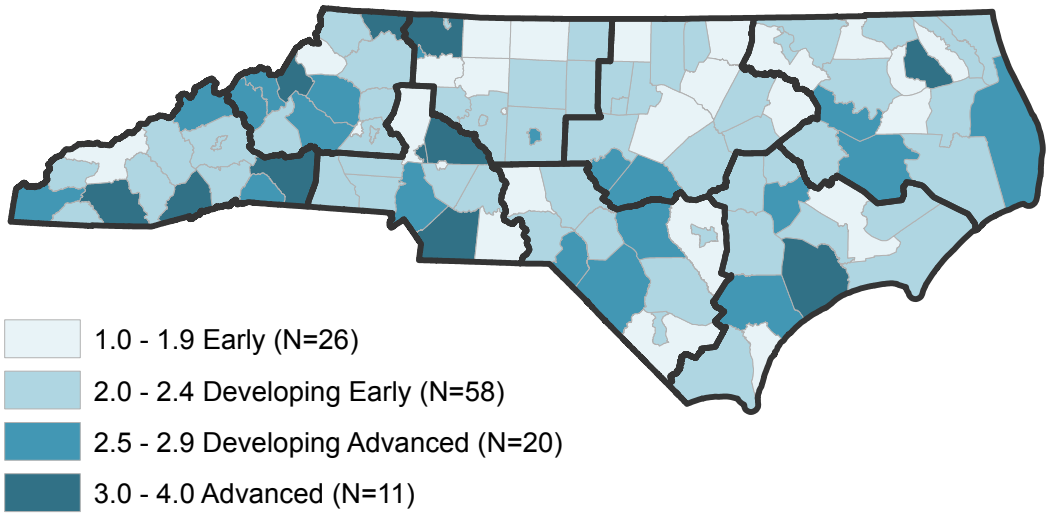

Figure 23: Content and Instruction Self-Assessment Ratings by LEA

2. The Rubric results for the self-assessment of progress on Data and Assessment shows that, on average, districts rate themselves as more advanced in this category than in others, with 32 rating themselves as advanced and only 12 rating themselves as early. The systems provided by the state have had positive impacts in this area. The data overall data for LEAs and charter schools are shown in Figures 24 and 25, and the self-assessment category for each LEA is shown in Figure 26.

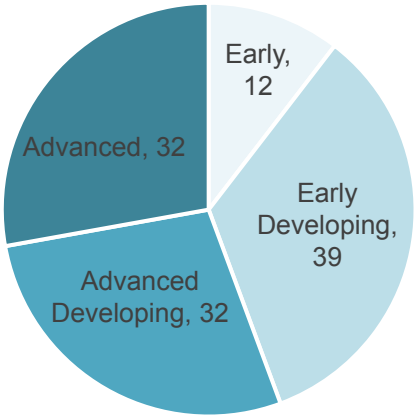

Figure 24: LEA Data and Assessment Self-Assessment Ratings

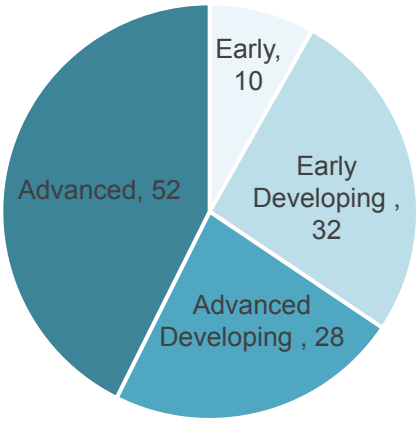

Figure 25: Charter School Data and Assessment Self-Assessment Ratings

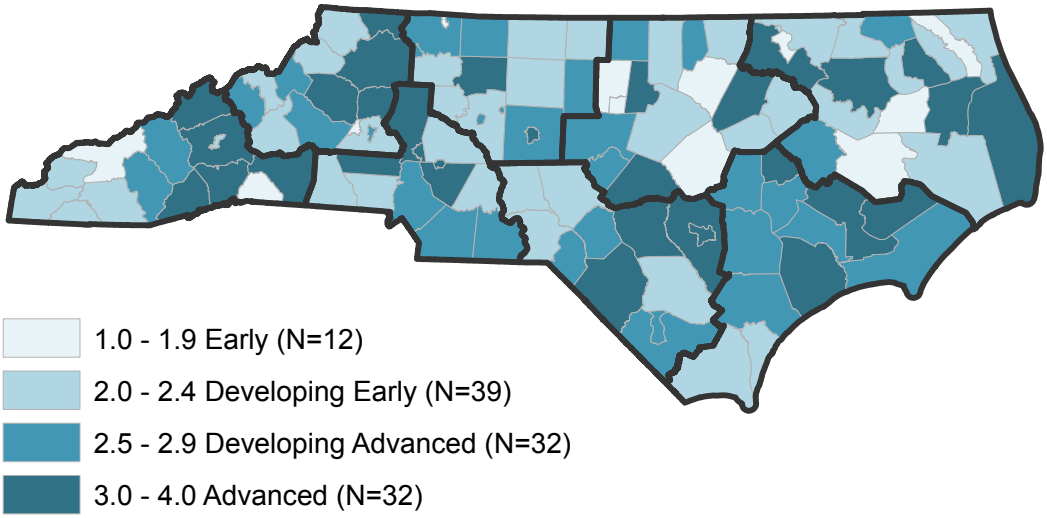

Figure 26: Average Data and Assessment Self-Assessment Ratings by LEA

3. The changes in curriculum standards, combined with a lack of funding to buy textbooks, has accelerated the transition to digital content in many districts. Many teachers are now using OER and Internet resources in instruction, along with instructional materials that they are creating or that schools are purchasing.
4. Teachers in schools that have digitally-enabled learning environments report increased success in differentiating learning to meet individual student needs. They note the value of formative and benchmark assessment data collected online to do so.
5. While integration into instructional practice varies, the majority of teachers actively use digital tools to streamline curriculum planning and administrative tasks.
6. Educators are generally supportive of the transition to digital learning resources in place of textbooks, but struggle to find and evaluate standards-aligned, high-quality digital content across all K-12 content areas.
7. Many districts have paid groups of teachers and other staff during summers to gather, create and organize digital curriculum resources to be used throughout the district. Smaller districts have strugged to find the resources to undertake this effort as comprehensively and in some cases have formed cross-district consortia to complete this work.
8. Educators note that statewide or cross-district collaborations around identifying, reviewing and procuring digital resources would be beneficial and cost-effective. NCDPI staff have already begun to develop cross-district collaborations in specific content areas to address this need.
9. Free open education resources are already in use by many teachers and students, who have found some to be of high quality.
10. NCDPI staff are involved in national efforts to further the use of OER, including, for example, the OER Collaborative funding by the Hewlett Foundation, that provide valuable information and resources for the State.
11. Students perceive the teacher's role in a digital learning environment to be as a

facilitator of the education process, providing both guidance and resources. Educators are supportive of this role, but lack sufficient exemplars and guidance about how to make this transition.

12. Educators see the potential of centralized assessment item banks and data systems, but note a lack of sufficient items that are well-designed and aligned to standards for some content areas and grade levels.
13. Teachers would like to have access to resources that support performance-based, competency-based and portfolio assessments, as well as the assessment of higher-order thinking skills.
14. Overall, the establishment of Home Base supports the digital learning transition in North Carolina, and it is widely viewed as a potentially positive contribution to the work of schools and districts. However, educators are looking for improvements and updates to make the system more useable and effective in meeting their needs.

    Further information about Home Base, along with the specific findings and recommendations about the Home Base system, are provided under recommendation #4 below.

Recommendations

Based upon these findings, we offer the recommendations and goals summarized in Table 5 and described in more detail below:

Recommendations	Goals
• Establish standards, review processes, and collaborative procurement for digital learning resources. Standards address curriculum content, personalized learning approaches, effective uses of technology, and technical requirements.	• High-quality, personalized, interactive digital learning resources are available to all students. • Effective systems are in place for teachers to select, create, organize, share, review, and use digital learning resources and curricula.
• Support the use and sharing of high-quality open educational resources and teacher-created resources.	• The cost of educational resources is reduced while maintaining quality and alignment with the North Carolina curriculum standards.
• Provide digital tools that enable educators to use student data to improve teaching and learning.	• All teachers use assessment data to personalize instruction and increase student achievement.
• Update Home Base tools and support systems to further meet the needs of educators, students, and parents.	• Home Base use increases significantly. • Teachers, students, and parents rate highly the value of Home Base.

1. *Establish standards, review processes, and collaborative procurement for digital learning resources.*

Most digital content has traditionally been purchased at the LEA, school, or individual classroom level. While many purchases of the same software are being made, there are currently no statewide systems that allow districts to collaboratively procure content or to share information about the quality of digital content prior to purchasing. The increased availability of Open Education Resources (OERs), which vary greatly in quality, furthers the need for content standards and distributed review processes. The goals for this and the other recommednations in this section are to have: (a) high-quality, personalized, interactive digital learning resources available to all students; and (b) effective systems for teachers to locate, select, create, organize, share, review, and use digital learning resources and curricula. Therefore, we recommend NCDLC undertake the following actions:

a. Form working groups to develop standards for digital content across curriculum areas and grade levels.

The standards can build in part on those previously used for textbooks in addressing alignment to the North Carolina curriculum standards, but must also address requirements specific to digital learning, such personalization, interactivity, use of online resources, appropriateness for students of different ages, accessibility to students with special needs, and other areas. NCDPI has already begun work in this area.

b. Develop recommended technical standards and sample RFP language for software purchases.

The language will outline standards for integration, data privacy, quality of service, and system requirements. The North Carolina standards should build upon the work of the IMS Global Consortium, a non-profit standards body that is developing frameworks for digital content and student data to be securely and transparently shared between platforms. In addition, North Carolina should build upon the work of Houston ISD, which has developed a model set of standards for content procurement that require vendors to integrate their content into the district learning management system, based on current technical standards. A similar approach is recommended for North Carolina to guide integration of digital content products with statewide data systems, while ensuring that data privacy requirements are met - specifically, requiring that vendors integrate their content into the state learning objects repository or district learning management systems. The IMS standards also allow for content to be distributed in a modular format (e.g. for a single topic or chapter), allowing districts maximum flexibility in procuring content.

c. Facilitate consortium purchases of digital content and applications being used across districts through the collaborative procurement process.

The Textbook Warehouse provides well-designed processes for the collaborative procurement of textbooks, resulting in cost savings to schools and districts. These processes need to be revised to address the different purchasing arrangements for digital resources (e.g., annual renewable licensing rather than purchasing physical products that will be used for multiple years), as well as how they are distributed and used. Additionally, many software packages are made available at a per-student rate,

with the rate being variable based on the number of students. Therefore, we recommend that the state facilitate consortium purchasing agreements to allow districts to purchase digital content packages at the lowest possible cost. (Section 1-A under Policy and Funding provides related recommendations for updating state legislation and regulations relevant to education content procurement.)

To support the effective use of collaborative procurement, we also recommend that NCDLC do the following:

- Provide rubrics, processes, targeted professional learning opportunities and support structures to enable schools and districts to evaluate instructional effectiveness of digital content, and to share their evaluations with others across the state.
- Conduct a study to identify the software packages being purchased across the state, and the OER products being widely used. The best available information is two or more years old and not complete.
- Identify high-quality digital content packages that meet recommended technical requirements and that could yield a significant cost savings if purchased as a statewide license through a collaborative procurement process.

Actions Steps and Metrics

	Year 1	Year 2
Action Steps	• Develop a set of content procurement standards that facilitate open standards, data security, and content modularity. • Develop software selection and evaluation rubrics to be made available statewide. • Conduct a survey of LEA, school, and teacher software purchasing to determine the current state of software use throughout the state.	• Issue RFPs and vendor selections for consortium purchasing • Negotiate purchasing agreements for content based on statewide consortium pricing. • Allow LEAs to begin ordering consortium content for year 3. •
Metrics	• A set of technical and instructional standards are published for vendors and adopted as SBE policy for centrally-procured content (and encouraged for LEA content). • Software rubrics are published in the NCDLC District Toolkit. • The district toolkit contains rubrics where LEAs can record and share their purchasing and renewal decisions.	• RFPs developed and LEA purchasing catalog made available.

2. *Support the use and sharing of high-quality open educational resources and teacher-created resources.*

High quality Open Education Resources are becoming more widely available, with support from individual states, consortia of states, and funders such as the Hewlett Foundation, Gates Foundation, and National Science Foundations. These resources, typically provided under *Creative Commons (CC) licenses*[12], provide opportunities for cost savings, local adaptations, and cross-district collaborations. The overall goal is to reduce the cost of educational resources while maintaining quality and alignment with the North Carolina curriculum standards.

North Carolina already has supported development of a number of high quality open education resources, including the STEM curriculum materials development by the North Carolina School for Science and Mathematics as part of Race to the Top, the North Carolina History digital text developed by LEARN NC, and resources developed by educators throughout the state. NCDPI staff have already been involved in national efforts and have been faciltiating in-state collaborations.

To further the use of OER, we recommend the following:

a. Form an OER Working Group to plan ways to support the selection, development and use of OER throughout the state.

Many districts pay teams of educators during the summer to develop curriculum maps and resources, as well as to review and select available OER resources for use in their schools. This work could build upon the curriculum development collaboratives established in social studies, working groups in science, and other district/regional efforts and benefit by cross-district sharing of lessons learned and materials produced, along with professional learning opportunities about curriculum selection and development for the educators involved in the district teams. This Working Group should seek ways to encourage collaborations on content selection and curriculum development across districts, charter schools, community colleges, colleges and universities, museums and other organizations.

b. Support the use of Canvas Commons and the Learning Object Repository to further the developing, sharing and use of OER content.

Specific actions would include the following:

- Provide technical assistance to districts and organizations with course curriculum maps to migrate these resources to the Learning Objects Repository. The North Carolina Virtual Public School is currently redeveloping all of its content for the Canvas platform, as is the School of Science and Mathematics. Wake County Public Schools and Guilford County Schools, for example, are moving to Canvas and have already established curriculum maps with embedded OER. The NCDLC should assist such organizations with making content available statewide through the Learning Object Repository.
- Support the revision of existing OER content to make in available in Canvas and other learning management systems used by North Carolina schools. This would

[12] Creative Commons licenses are issued by content creators as an alternative to traditional copyrights in order to define how others may use, distribute, or modify the work.

include content from the North Carolina School of Science and Mathematics, (NCSSM), LEARN NC, LEAs, charter schools, universities and community colleges, and other content providers. This would make content that has already been developed by North Carolina organizations, often with State funding, available to all teachers and students.

- Utilize the content rating and feedback systems that exist within the Learning Object Repository to collect data on the quality of OER.

Action Steps and Metrics

	Year 1	Year 2
Action Steps	• Complete integration of the LOR with Canvas. • Begin moving state-developed curriculum into the LOR • Solicit teachers to begin developing and uploading content to the LOR. • Contract with a service to vet OER to be added into the LOR. • Form OER working group	• Develop a teacher network to publish LEA and teacher curriculum materials to the LOR. • Continue to contract with a service to vet OER. • Discontinue the availability of the curriculum management components of Schoolnet.
Metrics	• A teacher network is formed to provide content to the LOR based on district curriculum maps. • A service is procured and begins to contribute OER into the LOR. • A "cookbook" is published for LMS vendors for 2-way integration into the LOR	• At least 50 courses' worth of material are uploaded to the LOR and made available. • Teachers are able to find materials to use in the LOR as measured by surveys to be issued by Home Base Advisory Board.

3. Provide digital tools that enable educators to use student data to improve teaching and learning.

The Assessment Task Force is currently conducting a review of formative and summative assessment in North Carolina. Pending the results of their study, we are recommending the following to enable all teachers to use assessment data to personalize instruction and increase student achievement:

a. Add assessment items and model benchmark assessment in all subject areas and grade levels.

With both ClassScape and Schoolnet, the State has provided teachers with the ability to develop and administer interim and benchmark assessments for students, with pre-existing item banks available in some subject areas. Additionally, the State has provided the MClass reading diagnostic assessment system to schools and is requiring its use in grades K-3. Teachers in Career and Technical Education subject areas were previously able to use ThinkGate (which has recently gone out of business), and NCDPI is currently in the process of migrating these assessment items to a new platform. While the use of Schoolnet is available to all teachers, there are a limited number of subject areas in which sufficient item banks are available. In addition, there are no pre-made validated

benchmarks available for schools and districts for any subject areas. We recommend that teams of educators and assessment experts be formed to curate existing and new assessment items and develop model benchmark assessments in all subject areas and grade levels. This service is currently being provided by NC State University Center for Urban Affairs and Community Services and NCDPI Career and Technical Education staff.

b. Work with interested schools and districts to pilot assessment systems that support emerging approaches.

These include: (a) adaptive diagnostics assessments to help teachers better identify student skill gaps and track student learning; (b) portfolio assessments, which require systems that have the capacity to store and organize student work samples; (c) competency-based systems that support using alternative ways to obtain and demonstrate competencies tied to micro-credentials or badging approaches; and (d) learner profiles, that combine quantitative and qualitative data to support personalized learning approaches. While there is a great desire to move quickly to these types of assessments, the technology infrastructure to enable them is still emerging, and needs to be continuously reviewed and updated.

Action Steps and Metrics

	Year 1	Year 2
Action Steps	• Conduct at least five pilots of innovative evaluation systems, contingent on available funding. • Continue to develop assessment items for all subject areas within Schoolnet.	• Conduct an additional five pilot studies. • Continue to develop and refine assessment items. • Conduct a market scan for emerging technologies in assessment, based on the pilot studies. • Conduct a market scan of available assessment platforms to best determine next steps.
Metrics	• Evaluation plan and results for assessment pilots. • Home Base user survey reports increase in the quality of assessment items available to teachers.	• Evaluation plan and results for assessment pilots. • Home Base user survey reports increase in the quality of assessment items available to teachers. • The results of the market scan will determine budgetary requirements.

4. Update Home Base tools and support systems to further meet the needs of educators, students, and parents.

North Carolina K-12 educators and students have long benefited from centrally provided digital tools and resources, including LEARN NC professional development resources, a statewide student information system (transitioning from SIMS to NCWise, and most recently, to PowerSchool), NCTest and ClassScape assessment tools, NC WiseOwl, and others. NCDPI's Home Base platform was designed as part of the State's Race to

the Top work and launched in August 2013, providing for a modern Student Information System (SIS), an Instructional Improvement System, and tools to support the North Carolina Educator Evaluation System. Home Base supports curriculum management, instructional content, assessment, student progress tracking, educator evaluation, evaluating, professional learning, information dissemination to parents, and data-informed decision making at the classroom, school, district and state levels. That is, the Home Base platform addresses elements of *content and instruction*, *professional learning,* and *data and assessment.* Since Home Base is central to the state's transition to digital teaching and learning, cuts across the categories of the Digital Progress Rubric, and needs to be considered as an integrated system of applications, the findings and recommendations directly relevant to Home Base are provided in this section.

Home Base is comprised of a suite of applications that are foundational elements of a digital learning environment. The following suite of applications currently comprise the Home Base system:

Pearson Powerschool[13] is the student information system (SIS) for all public schools in North Carolina. The SIS houses key data about students (i.e., demographic information, course schedules, current courses and a summative assessment history) required for school recordkeeping. Powerschool also provides an API interface to allow controlled and restricted access to student data for use in third-party applications. North Carolina is unique in having a single SIS used by all LEAs and charters that simplifies the connection of student demographic and roster data with applications like learning management systems and online assessment platforms. All LEAs and charter schools are required to use this system. Powerschool has recently been sold by Pearson to Vista Equity Partners, with the transaction expected to close in the third quarter of 2015. The long-term effects of this transaction on North Carolina, specifically on the interoperability with the other components of Home Base, are unclear.

Pearson Schoolnet is an assessment platform and instructional management system that primarily supports teachers. Specifically, Schoolnet helps teachers and administrators with curriculum management, classroom and benchmark assessment management, and data visualization of key performance indicators. Though this component is considered an optional part of Home Base, it has been available to districts and schools free of charge for the past three academic years. Moving forward, LEAs and charter schools will be given the option to continue their access through a fee-based system[14]. For the 2015-2016 academic year, NCDPI offered LEAs and charter schools an opt-in cost for the combination of Schoolnet and the Canvas learning management system (described below) of $1 per student.[15] In total, 114 LEAs and 47 charter schools accepted the Schoolnet-Canvas opt-in offer – of those, that opted in, 97 LEAs and 22 charter schools also signed contracts to use the Canvas learning management system.

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[13] Pearson announced in June 2015 that it has agreed to sell the PowerSchool business to private equity firm Vista Equity Partners.

[14] The cost to LEAs and charters for the Home Base system covers some of the content procured for use within Schoolnet,

[15] The NCDPI offer subsidizes what would normally be $4/ADM for Schoolnet and $3.74/ADM for Canvas. As of 7/11/2015, 76 LEAs and 34 charter schools have opted in.

True North Logic Educator Evaluation System provides a workflow engine and access to tools designed to evaluate and monitor school executive and teacher performance. It replaces the prior McREL system. This system supports the use of the North Carolina Educator Evaluation System (NCEES). It eliminates the need for paper records, streamlines the process, and facilitates the use of data at the school, district and state levels. LEAs and charter schools are required to use this system to implement the mandatory educator evauations in compliance with State Board regulations.

Pearson OpenClass is a freely available learning management system that integrates with the Google Marketplace, includes access to curated open education resources, and operates as a social networking platform. Schools using OpenClass are encouraged to use it for communication and collaboration between students and teachers.

True North Logic Professional Learning System (PLS) provides a course catalog, registration system, and embedded learning management system for the creation and delivery of online professional learning modules. NCDPI staff have created at least 88 online learning modules that are hosted in the system. All LEAs and charter schools have access to the system and the professional learning resources that it houses. LEAs and charter schools may also use the TNL PLS to deploy locally managed course catalogs and to develop and deliver their own online professional learning modules.

In addition, while not considered part of Home Base, the *NCTest system* is used to securely deliver summative (End of Course and End of Grade) assessments to students. It interacts with PowerSchool to transfer school rosters and student data between the systems. Educators can also use Schoolnet for other formative and benchmark assessment purposes.

Infrastructure services developed by the NC Education Cloud team support content and identity integration with and between Home Base applications. These services include:

The NC Learning Object Repository (NCLOR) service is a digital catalog of learning objects that leverages the Pearson Equella Digital Asset Management (DAM) software product. Originally implemented by the Community College System, its use has now been extended to K-12 educators. The NCLOR has interfaces for digital content managers and for educators. Digital content managers are able to manage collections of digital resources via content vetting workflows and labeling resources with descriptive metadata tags. Educators leverage the labeling through search interfaces that facilitate discovery and retrieval of desired resources. Searchable metadata labels include grade level, subject area, standards, resource type, and many more. An open application programming interface (API) allows tight integration with popular off the shelf learning management systems.

The Identity and Access Management (IAM) Service provides LEAs and charter schools with a tool to help manage the authentication and authorization needs of their students, employees, and guests (and eventually parents) in accessing cloud-based resources. It provides self-service capabilities to all end users that allows for password management. The IAM service supports delegated administrator capabilities to LEA and charter school technology leadership.

In March 2015, NCDPI announced the establishment of a statewide contract with Instructure for their *Canvas learning management system* (LMS). The Instructure contract establishes Canvas as the LMS platform for the North Carolina Virtual Public School (NCVPS) while also offering all North Carolina public schools the option of accessing the Canvas platform under favorable terms. The LMS procurement, a

collaboration between NCDPI, NCVPS, LEA instructional leaders, and the Friday Institute NC Education Cloud team, illustrates the value of a well-designed comprehensive request for proposals (RFP) and of cooperative purchasing. The LMS RFP specified requirements for PowerSchool integration, LOR integration, IAM integration, adherence to content standards including the IMS Global learning tools interoperability framework, and myriad requirements related to the functionality, performance and support of the LMS as a service. Canvas provides a more advanced LMS than was available previously in Home Base, as well as better integration with the existing Student Information System and Learning Objects Repository. It also follows standards that allow for the transfer of lessons to and from competing LMS platforms, including Blackboard Learn, Schoology, and Moodle which are used by some North Carolina LEAs and charter schools. The state procurement process takes advantage of the economies of scale to provide a greatly reduced price for LEAs and charter schools that choose to use this system – well under half the amount per student that LEAs have paid in the past. In addition to NCVPS, the NCSSM and the NC Center for the Advancement of Teaching (NCCAT), along with 97 LEAs, and 22 charter schools enrolling more than one million students, have already signed on to use the Canvas LMS, with others others considering a move to the state Canvas contract when their existing LMS contracts end. In addition, several competing LMS providers have reduced their price to North Carolina K-12 customers to match that offered through the NCDPI contract. This provides an example of the value of the collaborative procurement process recommended in this plan and the need for ongoing evaluation and updating of Home Base.

The combination of the components of Home Base with NCTest, NCLOR, IAM and the new LMS provide a large and complex system of interconnected software, intended to serve multiple functions for large numbers of diverse users, including students, teachers, parents, and school, district and state administrators. There is ongoing development of these types of systems in a highly competitive marketplace, so that improved tools continue to become available. In addition, as North Carolina educators and students employ these systems, they become more sophisticated in their use, and therefore in the capacities they would like these systems to provide. As a result of these factors, it is essential that North Carolina continually evaluate the effectiveness of these systems in meeting the needs of educators and students; work with vendors on updates to provide increased functionality; and plan to implement next-generation systems on a timely basis.

Home Base Findings

As a part of data collection for the NC Digital Learning Plan, the Friday Institute conducted a review of information on how educators currently use the available systems and their recommendations for improvements:

1. Overall, the establishment of Home Base supports the digital learning transition in North Carolina, and it is widely viewed as a potentially positive contribution to the work of schools and districts. However, educators are looking for improvements and updates to make the system more useable and effective in meeting their needs.
2. Most people report that it was a positive replacement to the NCWise system. However, there were initial problems with system availability during the initial deployment. There were also several outages at the start of the 2015-2016 school year due to issues with integration with the IAM service and a datacenter failure.

3. PowerSchool has API availability for third-party applications to exchange data securely. But there are significant additional expenses to both vendors and districts for use of the API and integration of these tools, which has limited districts in connecting PowerSchool with other software they use outside of the state provided tools. Many districts use file downloads and other similar methods of extracting data from PowerSchool. The lack of data control processes surrounding these types of extracts poses significant risk to student data privacy.
4. NCDPI has developed several regional support structures across LEAs (i.e., Schoolnet Survey, Home Base Resource Consortium, Home Base Partnership Sites, etc.) to both gather feedback on Home Base performance and to deliver information about improvements to the system. In addition, The NCWise Configuration Control Board has continued to meet after the transition from NCWise to PowerSchoool. Home Base advisory structures exist across NCDPI, including regional user group meetings facilitated by NCDPI and LEA staff, but there is little coordination or communication among them.
5. Teachers and leaders who have used the Schoolnet component of Home Base have a generally positive response to the assessment and reporting functions of the tool. The addition of ClassScape items to Schoolnet, combined with the advanced analysis capabilities, has made Schoolnet an asset for assessment in reading and math. Several capacity failures in the fall of 2014, combined with a lack of available high-quality content in some subject areas, has hindered Schoolnet from reaching its full potential as an assessment platform.
6. While educators are already finding online assessment tools and item banks to be valuable, they are looking for future improvements in the systems available to them. Specifically, the would like to have available banks of high quality assessment items in all subject areas mapped to North Carolina standards, along with easy-to-use and reliable system for creating and administering tests and for reporting and analyzing results at the student, classroom, school and district levels.
7. Several districts have used Schoolnet to search for digital content but few use it to create lesson plans, resources or curriculum units. Teachers report that high quality resources are available for some subject areas and grade levels, but are lacking for others. In addition, they report that the process for locating materials is hindered by ineffective navigation and the process of downloading lessons is cumbersome. Furthermore, they report that Schoolnet implementation as a lesson-planning platform is hindered by a cumbersome vetting and review process, a lack of collaboration options, and a lack of integration with LMS systems. Overall, educators have expressed a clear need for improved tools for lesson planning and management.
8. In an effort to improve teacher use of the system, NCDPI has negotiated additional requirements with Pearson to add improved collaboration functions as well as the ability to peer-rate submitted material within the Schoolnet platform. The tentative timeline for these additional features to be added is the beginning of the 2016-17 school year.
9. Technology Directors noted that Schoolnet has no automated import/export functionality. There is no way for a district that wants to migrate content to Schoolnet to do so, nor is there any way for a district to migrate Schoolnet data to another system. Teachers who create content in an LMS cannot automatically move that content into Schoolnet, and teachers who create content in Schoolnet cannot take

their content with them if they move to another district.

10. The process for submitting locally created content is slow and unclear, as it requires multiple approvals across the school, district, and state levels. The lack of feedback, the amount of metadata that teachers are required to enter before content may be reviewed, confusion about roles and responsibilities within the system and interoperability issues have all posed barriers to creating a significant amount of teacher generated content.
11. The Open Class product, a Pearson acquisition, is no longer being maintained by Pearson, and is scheduled to no longer be available as of 2018. While some who were new to using an LMS have found it to be useful, it has not been widely used, and educators experienced in using the tools prefer Canvas or other systems that their districts have made available.
12. There is a lack of clarity about whether NCTest is part of the Home Base platform. Additionally, NCTest has suffered from capacity failures during critical testing windows.
13. Teachers report difficulty navigating the TNL evaluation system. Teachers and principals found it cumbersome to use and confusing to navigate. NCDPI has been working with True North Logic to improve the usability of the evaluation system and has developed enhanced user guides.
14. Several districts have piloted using the TNL professional learning system to schedule and manage teacher-led professional development. Some have already transitioned away from the legacy SEA System application entirely in favor of the TNL PLS.
15. There is significant confusion about what is meant by "Home Base." Our findings indicate that the perceptions of the tool vary widely by district and by role. Additionally, while some applications are referred to by their branded name, some individual applications are referred to simply as "Home Base" or by functional titles created by NCDPI (e.g. Schoolnet is referred to as the NC Instructional Improvement System), causing further confusion.

Home Base Recommendations

a. Develop a Home Base portal to increase system usability.

The portal should provide sign-on and access to all Home Base applications, as well as facilitate data integration between the applications. This will improve usability of the full suite of tools. We also recommend that the portal be referred to as "Home Base" and the individual component applications be referred to by their product names, to reduce confusion among the user base.

b. Implement processes for the continuous improvement of the Home Base system.

As noted above, Home Base and related tools call for a continuous improvement process based upon ongoing evaluation of their use and functionality, and consideration of new and updated tools. We specifically recommend the following:

- Replace existing Home Base advisory structures with a new Home Base Advisory Board and user groups:
    - The Home Base Advisory Board will consist of Home Base users from across the state. The board should have diversity in roles and use cases. This board will

help set the strategic direction of the Home Base initiative, including reviewing stakeholder input and recommending changes to the platform.
    - User groups will be a combination of online communities and face-to-face meetings of job-alike users of the Home Base platform. The purpose is to share technical guidance, best practices, usage tips, needed updates and new features, and other information. This will also be a key group for the Home Base Advisory Committee to engage in working groups and to collect additional data from the field.

- Conduct an annual analysis of Home Base and state-managed digital content services to determine usability, usefulness in practice, effectiveness of the training programs and resources, and priorities for improvement. Data will inform the Home Base 2.0 Advisory Board and NCDLC leadership. Evaluation information should include:
    - Surveys of a representative sample of users;
    - Input from the Home Base Advisory Board and user groups;
    - Analyses of patterns of help desk requests;
    - Focus groups of representative users across the state;
    - System analytics to determine patterns of use of system components;
    - Analyses of workflows of major tasks for the Home Base users in order to streamline workflows to drive adoption and effective use.
- Conduct ongoing market scans, along with the collection of information from leading districts and states throughout the country, to ensure that North Carolina systems are keeping up with the available capabilities of the market;
- Analyze up-to-date and emerging standards to ensure interoperability across systems and to avoid proprietary systems that make North Carolina dependent upon a single vendor. For example, we need to be sure that curriculum resources in the LOR, assessment items in the Assessment System, and course materials in the LMS could all be transferred effectively to different systems as needed. By following standards, and selecting only vendors with robust, open Application Programmer Interfaces (APIs), the State will be able to effectively retain control of resources and data, and will be able to utilize them effectively and dynamically across systems. In addition, by utilizing standards-based systems, districts can opt in to use components of the statewide infrastructure, while using alternative software packages for certain elements of the system.
- Create a detailed roadmap and schedule of planned changes to Home Base, based upon the analyses described above. This will increase users' confidence in the long-term viability of Home Base and inform local planning for the use of Home Base, professional development, and decisions about purchasing other tools.

c. Provide a modern content development and sharing system within Home Base.

Specifically, this would involve two major steps: (a) support the use of the LOR as a platform for teachers to develop and share materials, replacing the curriculum management functions in Schoolnet; and (b) implement Canvas as the central LMS in the Home Base platform, phasing out the use of Open Class.

Canvas provides a modern, well-designed collaborative platform that enables educators to align standards with the scope and sequence for a course and curate resources from the LOR to support the scope and sequence. It also enables teachers to collaboratively

develop and share lesson plans, rate the quality of resources in the LOR, remix and modify resources in the LOR, and submit new resources to the LOR. The LOR already features the same integrations as Schoolnet, and also includes the ability to import directly to and from a course. In addition, the LOR already implements peer-review, lesson ratings, and easy sharing and collaboration. Access to the LOR is being facilitated as a part of the K-12 Cloud Computing initiative. Therefore, there would be no additional cost for this functionality. In addition, the State could leverage a savings by eliminating these redundancies in functions across applications.

Related specific recommendations include the following:

- Integrate an introduction to Canvas into the Home Base training sessions.
- Provide training statewide to interested educators into the full functionality of Canvas and its connections to PowerSchool and the LOR. We recommend that districts purchase training services when negotiating contracts with Instructure for the Canvas platform.
- Provide support for educators to make existing Open Education Resources available in the NC Learning Objects Repository, such as those from NCSSM and LEARN NC, and those developed by LEA teams.
- Provide connections for other standards-based LMS systems to integrate in to the LOR.
- Many districts are using their LMS for teacher professional development as well as for student learning. The True North Logic professional development system is an LMS platform based on Moodle. The possibility of NCDPI-generated professional development being made available as an IMS cartridge—a standard way to import courses for importing into Canvas or another LMS—be evaluated.

d. *Provide ongoing training, online resources, and help desk support to enable educators to use Home Base more effectively.*

Significant training and readily available support is required for any comprehensive set of software tools designed for use by many people for a variety of purposes. Ongoing training, along with detailed online tutorials, need to be available for educators in different roles, so specific learning opportunities are provided for teachers, instructional coaches, technology directors, assessment directors, principals and others. Appropriate training needs to be provided for novices just getting started with Home Base and those who are seeking to extend their expertise. In addition, educators need ready access to a help desk with knowledgeable staff who can address technical issues, respond to questions, and help guide users in making effective use of the system. The help desk also needs to provide an interface for school and district staff to the vendors, when their involvement is needed. Since NCDPI holds the contracts, the vendors are not responsive to support requests coming directly from school or district staff. In order to ensure that all LEA/charter staff are knowledgeable in the use of the tools provided as a part of the Home Base platform, we recommend the following:

- Contract with the application vendors to provide training within each region.
- Integrate the use of Home Base tools into existing NCDPI trainings and instructional resources.
- Create an online knowledge base to assist users with common use cases and

scenarios.

- Ensure that all NCDPI staff is trained in the use of Home Base, and is aware of how Home Base integrates in to their work areas.
- Conduct regional master scheduling workshops at the elementary, middle, and high school levels to help LEAs develop master schedules and use Power School for scheduling.
- Leverage the Home Base User Groups and OER working group to develop training and guidance resources for the use of Home Base

Action Steps and Metrics

Recommendation A	Year 1	Year 2
Action Steps	• Identify requirements for Home Base portal • Develop and issue RFP for Home Base Portal • Review RFP and award a vendor for development or procurement • Begin development process for Home Base portal	• Develop or procure Home Base portal • Pilot in several LEAs across the state • Deploy Home Base portal statewide
Metrics	• RFP issued and vendor selected	• Portal developed and ready for use • All districts and charters are using the portal to access the components of Home Base
Recommendation B	**Year 1**	**Year 2**
Action Steps	• Establish Home Base 2.0 Advisory Groups • Conduct a detailed survey of Home Base users, along with workflow analysis • Conduct a review to determine areas where data interoperability is currently not possible	• Home Base 2.0 Advisory Board reviews user survey data and ongoing market scans. • NCDPI begins to enact the Home Base roadmap and repeat the processes identified in years 1 and 2.

Metrics	• Home Base Advisory structures are established and meet on a published schedule. • Online communities of practice or listservs for the Home Base user groups are established and advertised to users. • Home Base user surveys are developed and capture data from at least 20% of the population	• NCDPI, in consultation with the Advisory Board, develops a 4-year plan for Home Base and shares through the User Groups for feedback and revisions.
Recommendation C	**Year 1**	**Year 2**
Action Steps	• Announce two year plan to phase out Schoolnet for the use of digital content. • Complete integration of the LOR with Canvas. • Begin moving state-developed curriculum into the LOR • Solicit teachers to begin developing and uploading content to the LOR. • Contract with a service to vet OER to be added into the LOR.	• Remove procured content from Schoolnet. • A teacher network is developed to publish LEA and teacher curriculum materials to the LOR. • Continue to contract with a service to vet OER. • Discontinue the availability of the curriculum management components of Schoolnet.
Metrics	• A teacher network is formed to provide content to the LOR based on district curriculum maps. • A service is procured and begins to contribute OER into the LOR. • A “cookbook” is published for LMS vendors for two-way integration into the LOR and the SIS • NCDPI makes online PD provided by NCDPI available within the Canvas LMS and as an IMS Common Cartridge	• At least 50 courses worth of material are uploaded to the LOR and made available. • Teachers are able to find materials to use in the LOR as measured by surveys to be issued by Home Base Advisory Board.

Recommendation D	Year 1	Year 2
Action Steps	• Establish contracts and hold regional trainings for charters and begin LEA-level trainings. • Establish knowledge base and begin adding content • Conduct training for all NCDPI staff • Conduct scheduling training regionally	• Continue to add materials to the knowledge base • Integrate Home Base tools into NCDPI training materials • •
Metrics	• All charters and at least 20% of LEAs have had training on Home Base tools • All NCDPI staff are able to utilize Home Base in direct service work • LEAs have the opportunity to attend scheduling training	• All LEAs and Charters have had training on Home Base tools. • Staff who miss training opportunities are able to utilize the knowledge base to learn how to use the Home Base tools (as measured by yearly survey of staff)

LOCAL DIGITAL LEARNING INITIATIVES

While districts and schools have the primary responsibility for ensuring digital-age teaching and learning for their students, the State has a role in guiding and supporting local education leaders in planning and implementing digital learning initiatives and in ensuring that all students have equitable access to digital learning.

Findings

There has been significant progress in North Carolina, but much remains to be done. The following findings inform our recommendations about supports for local digital learning initiatives.

1. Successful schools and districts have highly collaborative leadership teams with collective expertise in digital learning, professional development, curriculum, assessment, technology infrastructure, finance, and leading the change process. Many schools and districts are looking for guidance on how to create these types of teams and organize their work effectively, as well as professional learning opportunities for the leadership team members.
2. Since 2009, the Golden Leaf Foundation has provided 40 grants, totalling about $24.7 million, to support digital learning intiatives in economically distressed areas of the State. This funding, along with the related technical assistance, professional development, and evaluation services provided, has played a major role in enabling rural districts to begin the transition to digital-age learning.
3. Figure 27 shows, by district, the percentage of one-to-one (1:1) schools in which every student has a connected digital device.[16] While most districts report having at least a 1:1 pilot school, only 10 provide devices to every student in all schools. Overall, the June 2015 data show 688 schools in 93 districts with 1:1 programs—more than twice the number shown in the 2013 survey.

[16] Data from the 2015 North Carolina Annual Media and Technology Report (AMTR) survey.

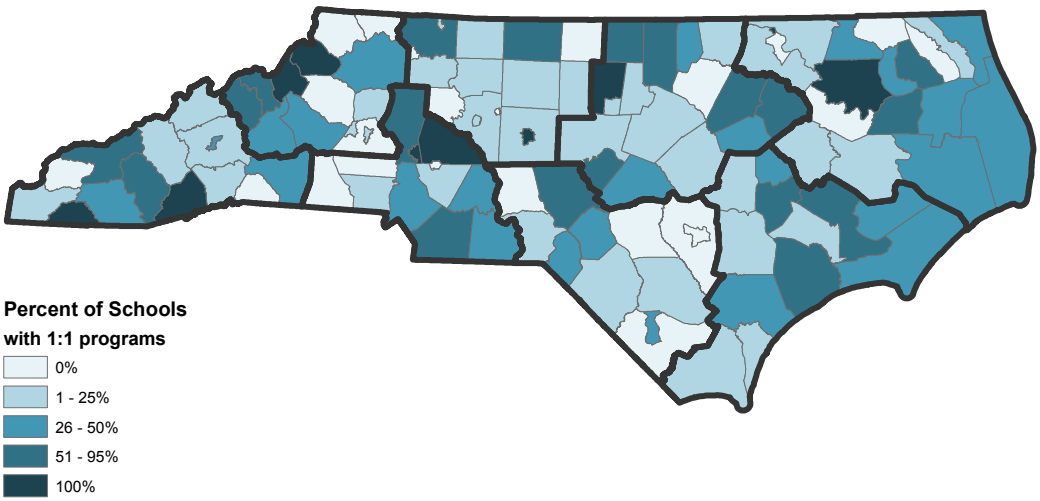

Figure 27: Percent of Schools with 1:1 Programs by District, as of June 2015

4. A variety of approaches to 1:1 programs are used in North Carolina districts. For example, Mooresville Graded School District has implemented a K-12 program with Apple MacBooks, and Rutherford County has a grades 6-12 program also with MacBooks. Union County is using Lenovo Chromebooks in grades 6-12; and Charlotte-Mecklenburg is using Hewlett Packard Chromebooks in a middle school 1:1 initiative. Clay County is employing iPads through grades K-12, while Wake County is piloting a bring-your-own-device (BYOD) program in selected elementary, middle and high schools.
5. While the AMTR data was collected toward the end of the 2014-15 school year, it is already out-of-date at the start of the 2015-16 school year, as districts continue to implement new 1:1 programs. For example, for the new school year, Montgomery County has purchased 2,330 PC laptops for grades 6-12, using funding from a federal Invest in Innovation grant, and 330 PC laptops for grade 5 using Title I funding. They have also added six instructional technology facilitators and two technicians, with the grant funding, and are implementing the Canvas Learning Management System and provided professional development for their teachers and administrators.
6. District and charter schools' leadership teams identified that they need support to develop and plan for the implementation of digital learning based upon their readiness, as documented in the NC Digital Learning Progress Rubric, and building upon the assets, context and resources available in their schools. The results of the Rubric highlight specific areas in which districts and charter schools need to develop more in-depth understanding of strategies to move their schools forward and models for how to best implement digital learning. These supports need to be targeted to the needs of the individual district or school, since they each begin in a different place and their progress on different dimensions of the rubric varies widely. Figure 28 shows the number of LEAs that fall into each of the levels of progress on the overall rubric and for each of the five specific areas: (a) leadership; (b) professional learning; (c) content and instruction; (d) technology infrastructure and devices; and (e) data and assessment. Figure 29 shows the same data for the 120 charter schools that responded.

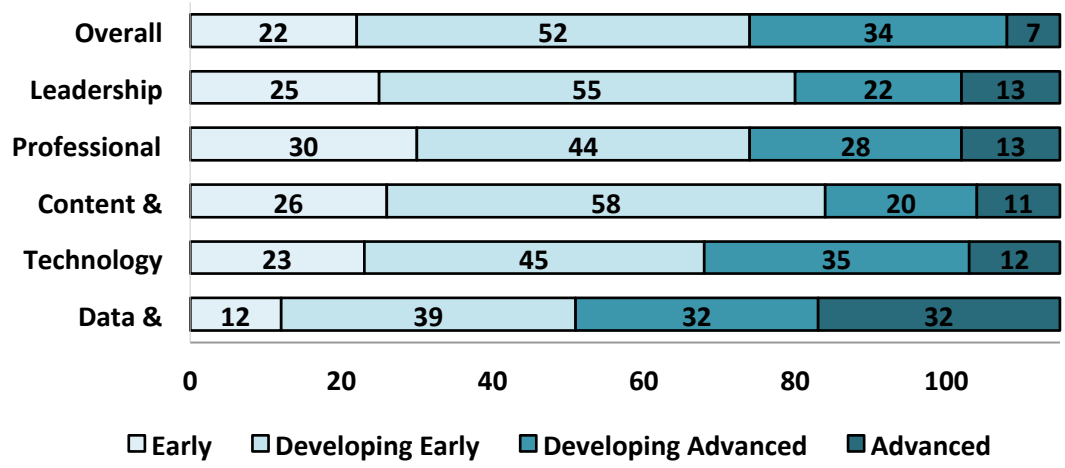

Figure 28: LEA Self-Assessment Data Overall and by Area

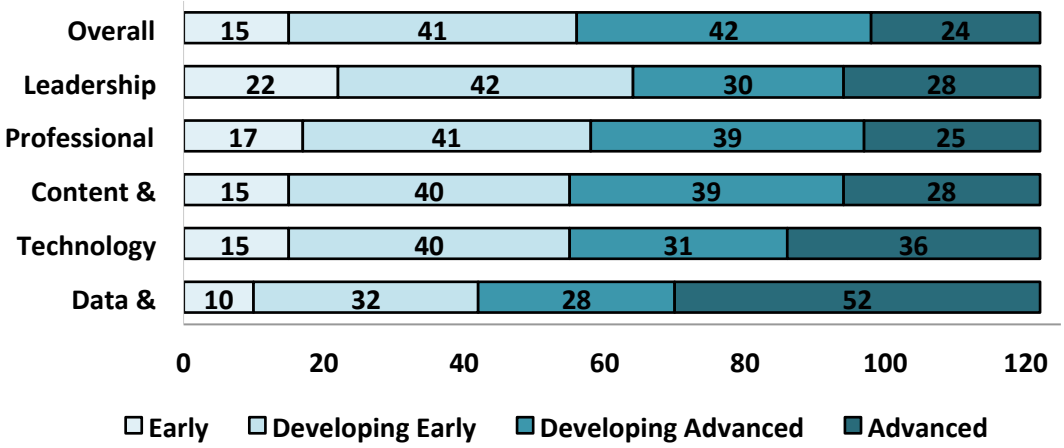

Figure 29: Charter School Self-Assessment Data Overall and by Area

Recommendations

Recommendations to support successful digital learning initiatives in districts and schools throughout the State are summarized in Table 6 and described in more detail below.

Recommendations	Goals
• Guide and support local leadership teams in planning and implementing digital learning initiatives through face-to-face, online, and blended activities, as well as a toolkit of resources.	• All districts and schools advance on each dimension of the Digital Learning Progress Rubric.
• Provide grants to support the development and dissemination of local innovative digital learning models.	• Effective digital learning practices are spread across all North Carolina schools.

Table 6: Summary of Local Digital Learning Initiatives Recommendations and Goals

1. Guide and support local leadership teams in planning and implementing digital learning initiatives.

While the Human Capacity section contains recommendations for in-depth professional development programs for individual educators, the recommendations here focus on direct and immediate supports to help leadership teams plan and implement successful digital learning initiatives. The goal is to enable all districts and schools to advance on each dimension of the Digital Learning Progress Rubric. The specific recommended activities are described below.

a. Provide a comprehensive, blended program to prepare and support district and charter school leaders in planning local digital learning initiatives.

This program should have a number of elements to address the overall needs of leadership teams working together and the needs of individuals who have specific responsibilities within the teams. We recommend that NCDLC provide the following, with districts and charter schools choosing which combination of opportunities meet their needs.

Leadership team planning workshops

The leadership team planning workshops will include initial one to two-day sessions for all core team members, including the superintendent, with follow-up day-long workshops on specific areas for applicable members of the leadership teams. The initial workshops will guide leadership teams through a planning process, which involves having them analyze the current state of digital learning in their district or school, set short-term and long-term goals, and define action steps for moving forward. The process is designed to serve groups ranging from those that are just getting started to those that are building upon years of prior initiatives. Participating teams work to articulate their vision for digital learning and develop an understanding of an effective culture and the essential systemic components, including curriculum, instruction, and assessment; professional learning; technology infrastructure and devices; community engagement; responsible

use and privacy issues, and budget and resources. These workshops will provide collaboration and team time so that districts and charter school leadership teams can learn from one another and have dedicated time to focus on planning and implementation of their digital learning transition.

District workshops will be held with teams of four to eight people from each district, including the superintendent. Separate workshops will be held for charter schools, since planning for an individual charter school is very different from planning for a district.

This is a high priority for launching the statewide digital learning plan, since it is the foundation for many of the other NCDLC activities. Therefore, we recommend workshops that can reach all 115 districts and 150+ charter schools in the first two years. After that, we recommend workshops that can accommodate a total of about one-fourth of the districts and charter schools each year, to provide opportunities for those that are ready for their next round of planning and those who have had changes in their leadership teams.

Additional one-day workshops on specific areas, such as professional learning, technology infrastructure, culture, data and assessment, and digital content, will be offered based upon team needs. Online programs to help local teams organize and lead their planning and implementation processes.

After the initial planning sessions, district and school-based leadership teams need opportunities to broaden the leaders involved within a district, continue their learning and collaboration around digital learning, and organize and structure their work. The Digital Learning Transition in K-12 Schools massive online open course for educators (DLT MOOC-Ed) was developed by the Friday Institute to help district and school leaders:

- Understand the potential of digital learning in K-12 schools;
- Learn about and develop action steps for the components of the digital learning transition;
- Assess progress and set future goals for the school or district; and
- Plan to achieve those goals.

This MOOC-Ed has been run four times (with revisions based upon research and evaluation each time) for district and school leaders representing public, charter and private schools – with nearly 7,000 educators representing over eighty countries, including nearly 900 from North Carolina, having participated thus far. Based upon the evaluation data, local team members working together to relate the lessons from the DLT MOOC-Ed to their own context makes the course very valuable. Alternatively, one or two members of a team may participate and then use the activities and resources to help organize the work with the rest of their local team. In combination with the resources in the Toolkit, described below, the MOOC-Ed provides a cost-effective, scalable way to help North Carolina education leaders continue their work planning and implementing local digital learning initiatives that are designed for success.

We recommend providing the DLT MOOC-Ed at least twice each year, in order to provide opportunities for leadership teams and individual educators to participate while they are engaged in planning digital learning initiatives. The course will continue to be updated annually.

Action Steps and Metrics

	Year 1	Year 2
Action Steps	• Develop plan for workshops and follow-up support for district leadership teams • Develop and offer three, one- or two-day overall district leadership team workshops and two, one- or two-day overall charter school leadership workshops to support planning for digital learning • Develop and offer approximately three to four area-specific workshops on the two highest need topics • Offer the Digital Learning Transition: Creating Future Ready Schools MOOC-Ed at least twice with some blended elements for NC leaders with regional opportunities offered by NCDPI's Digital Teaching & Learning Consultants • Incorporate all of these professional learning opportunities into the NCDPI-managed PD course catalog – specifically, in the True North Logic Professional Learning System.	• Offer three, one- or two-day overall district leadership team workshops and two, one- or two-day overall charter school leadership workshops to support planning for digital learning • Offer approximately three to four area-specific workshops on the two highest need topics • Develop additional workshops (or additional content for workshops) to continue to support the district and charter teams that participated in Year 1 • Offer the Digital Learning Transition: Creating Future Ready Schools MOOC-Ed at least twice with some blended elements for NC leaders with regional opportunities offered by NCDPI's Digital Teaching & Learning Consultants
Metrics	• Approximately 1/3 of all LEAs and ½ of charter schools have participated in the leadership team workshops and follow-up area-specific workshops • Approximately 1/3 of districts have leaders who have participated in the MOOC-Ed	• Approximately 1/3 of all LEAs and ½ of charter schools have participated in the leadership team workshops and follow-up area-specific workshops • Approximately 1/3 of districts have leaders who have participated in the MOOC-Ed

Toolkit of resources to support district and charter school digital learning initiatives

The Digital Learning Plan emphasizes the importance of recognizing and learning from districts and schools that are already developing models and approaches to digital learning that can inform further implementation across the state. The data collection efforts, including the deep dive site visits and the in-depth working sessions with practitioners, helped to identify additional examples, processes, and tools that could be shared to support other districts and schools. Building upon this research and the previous curation of resources, we recommend development of a District Toolkit that provides a range of resources that districts, schools, and digital learning coaches can use to further their work.

The District Toolkit will be a living document that will be updated continuously and added to as new resources and models become available. Following the guiding principle of *leveraging existing innovations, expertise and resources from throughout North Carolina,* NCDLC will work with districts and schools that are implementing digital learning innovations to document their approaches and results and to develop additional resources for the toolkit based upon the lessons learned.

To begin, the Toolkit will bring together existing resources that North Carolina educators have already been found useful, including, for example:

- The NC Digital Learning Progress Rubric
- Digital Learning-Focused instruments and protocols (e.g., STNA, STNA*S, S-STEM, T-STEM, LoFTI Classroom Observation, SLCS)
- The Digital Learning Transition MOOC-Ed
- The Future Ready Schools resources and self-assessment, developed by the Cheryl Lemke and Metiri Group for the Alliance for Excellent Education
- The Digital Learning Planning Guide developed by the Friday Institute for the Golden Leaf Foundation
- Videos and case studies of exemplary digital learning initiatives, gathered for prior professional learning activities
- Research-based lessons learned from digital learning implementations, including the prior IMPACT, NCLTI and Golden Leaf funded projects in North Carolina as well as work in other states
- Models of effective digital-age teaching practices across grade levels and content areas for use in professional learning activities

Additional resources will be added as needs are determined by the NCDLC Steering Committee, Regional Support Network, and other participants. These may include, for example:

- *Guides* for making decisions on critical elements, such as the selection and procurement of devices for students and teachers at different grade levels and content development versus purchased curriculum;
- *Instruments* for assessment or evaluation that inform planning and implementing digital learning, such as revisions to STNA or a student survey to provide input to district and school leaders about students' views about the use of digital learning;
- *Observation Instruments* that guide administrators and coaches in what to look for in instruction and in how to support and provide feedback to educators;

- *Videos* and other tools to help build capacity on what personalized, digital learning looks like, such as a guide to help principals understand digital learning competencies and evaluate the use of digital learning by their teachers;
- *Voices from the Field* case studies, interviews, and videos so that educators can learn directly from their peers; and
- *Exemplars* that highlight the strategies, lessons learned and results from the NCDLC-district or school partnership pilot digital learning initiatives described above.

Action Steps and Metrics

	Year 1	Year 2
Action Steps	• Continue to develop and update the toolkit of resources that supports district and school leaders • Create additional exemplars and include voices from the field and other resources as they are needed or become available • Ensure that the Toolkit is easy-to-use and accessible for all district and school leadership teams • Provide opportunities and reach out to ensure that district and school teams know that the Toolkit is available	• Continue to update and revise Toolkit based upon usage and needs of district and school leaders • Create additional exemplars and include voices from the field and other resources as they are needed or become available • Provide opportunities and reach out to ensure that district and school teams know that the Toolkit is available
Metrics	• Toolkit is available and is being updated in a regular way • Approximately 1/3 of districts and charter school leadership teams in the state have accessed the Toolkit • Toolkit is supporting district and charter school planning, including through the workshops	• Toolkit is available and is being updated in a regular way • Approximately ½ (total, including Year 1) of districts and charter school leadership teams in the state have accessed the Toolkit • Toolkit is supporting district and charter school planning, including through the workshops

2. *Provide grants to support the development and dissemination of local innovative digital learning models.*

Based upon our findings, we recommend two levels of grants, *Innovation* grants and *Planning and Pilot Implementation* grants. Both are based in part upon the Golden Leaf Foundation programs that have provided funding for digital learning initiatives in K-12 schools in Tier 1 and Tier 2 counties[17] throughout the state. The Golden Leaf Foundation has agreed to provide management of these grants and to continue their grant initiatives that have provided 40 grants totaling $24.7 million to support digital learning initiatives over the past six years. Golden Leaf has agreed to work with NCDLC to align their digital learning grant requirements with the State Plan. We recommended that eligibility for these grants be extended to all school districts and to charter schools if funding from other sources is available. The goal is to have effective digital learning practices spread across all North Carolina K-12 public schools.

a. Innovation Grants

A competitive grant program that will provide additional support for districts and schools that are implementing innovative programs that are potential models for others is critical for accelerating the implementation of digital learning across the state. The goals of the proposed grant program would be to: (1) further the development of existing digital learning initiatives and encourage new ones that may demonstrate model approaches to the transition to digital learning; (2) evaluate their success and document lessons learned; and (3) disseminate information to inform planning and implementation of digital learning initiatives in other schools and districts, including summits and site visits hosted by grantees. The addition of grant support will enable innovations to be implemented more quickly and widely and provide opportunities for more in-depth analyses of impact and documentation of the initiatives. NCDLC will work with the Educator Steering Committee and Advisory Board to develop a request for proposals that encourages continued progress in district and school digital learning initiatives, further exploration of innovations in digital teaching and learning, and collaboration and leveraging of expertise among districts. These grants should be for two or three years to allow for building and scaling the innovation and sharing with other districts. The number and size of the grants will depend upon the funding available, but grants should likely range from $200,000 to $2 million for districts, depending upon their size and their proposed plan, and $50,000 to $100,000 for charter schools.

b. Planning and Pilot Implementation Grants

Planning and implementation grants program for districts and charter schools will support those that are at earlier stages of development in their digital learning initiatives. These could range one-year planning grants of $10,000-$50,000 for those just getting started to two-year implementation grants of $100,000 to $250,000 for those ready to implement pilot programs. These grants should be handled through an application and review process, with the available funding used to support as many applicants that meet the grant requirements as possible.

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[17] The NC Department of Commerce defines economic distress tiers – see the 2015 North Carolina Development Tier Designations report.

Action Steps and Metrics

	Year 1	Year 2
Action Steps	• Develop the Innovations Grant program aligned with the DL Plan, including the RFP and other parameters for selecting grantees; issue a call for proposals; and make initial awards for the program • Develop the Planning and Pilot Implementation Grant program aligned with the DL Plan, including the RFP and other parameters for selecting grantees; issue a call for proposals; and make initial awards for the program	• Begin to implement the initial Innovations Grants awarded in Year 1 and consider issuing an additional RFP for the second year of grants depending on the design and timing of the program • Begin to implement the initial Planning and Pilot Implementation Grants awarded in Year 1 and consider issuing an additional RFP for the second year of grants depending on the design and timing of the program
Metrics	• Innovations Grant program is developed and initial grants are awarded • Planning and Pilot Implementation Grant program is developed and initial grants are awarded	• Innovation Grants are being implemented and an additional RFP is issued if in alignment with the Innovations Grant program developed • Planning and Pilot Implementation Grants are being implemented and an additional RFP is issued if in alignment with the Planning and Pilot Implementation Grant program developed

POLICY AND FUNDING

To ensure that all students have access to digital-age learning opportunities, the transition to digital learning requires updating legislation and policies to foster educational innovations and restructuring budgets to sustain initiatives. North Carolina already has made important progress—for example, the legislation that led to the development of this Digital Learning Plan (Figure 30)—but additional work is needed.

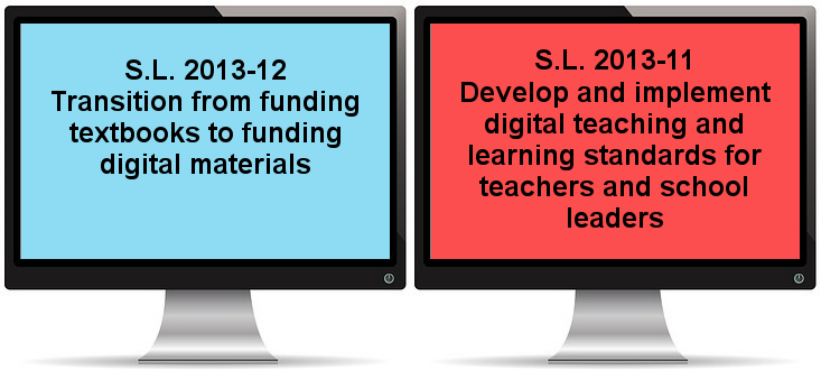

Figure 30: North Carolina Digital Learning Legislation

Two key questions frame implementation of each of the initiatives and actions recommended in the other sections of this document: (1) Does current state policy allow for the implementation of the initiatives and actions as described? and (2) How can and should these initiatives and actions be funded? This section outlines the current digital learning policy and funding landscape in North Carolina and makes recommendations for moving toward supportive and flexible policies and funding structures that will allow the state not only to make the initial transition to all-digital learning but also sustain that transition in the years ahead.

Findings

- Though most of the State's education-related statutes and State Board of Education policies were written in a pre-digital learning era, many already provide adequate flexibility to allow innovative digital-age models. There are some areas, however, in which revisions to current policies and statutes can better support digital innovations in schools, including: staffing, scheduling, use of State funding, and content selection.
- Data security and privacy remains a primary concern for educators, parents, and policy-makers as increased information about individual students is recorded in online systems.
- Most LEAs and charter schools lack sustainable funding sources or strategies for full-scale digital learning initiatives, and almost all of them highlight funding to provide and maintain devices for all students as their area of greatest concern. Some LEAs have secured short-term funding for initial device purchases but are at risk of being unable to maintain and update the devices over time.

Recommendations

Recommendations for state legislation, State Board of Education policies, and guidance for local policies that will support innovation in district and school digital learning initiatives are described below. This section also includes considerations for identifying sustainable funding for digital learning. Table 7 summarizes the recommendations and goals.

Recommendations	Goals
• Update State policies to provide support and flexibility for local digital learning innovations—including policies that support strategic staffing, mastery-based advancement, revised scheduling, and other innovations.	• School and district leaders report that State legislation and policies support innovation and that barriers have been removed. • North Carolina is frequently cited as a national leader in digital learning innovations.
• Provide guidance to help educators address privacy, security, copyright, and responsible use issues.	• Schools have minimal problems with the misuse of digital technologies; structures and systems are in place to effectively address any issues that do occur.
• Develop new State and local funding models to support and sustain digital-age learning.	• Sustainable funding exists and allows for long-term planning.
• Provide additional supports to districts and schools to ensure equity of digital learning opportunities for all students.	• Access to digital learning is addressed as part of the State's responsibility to provide a sound basic education to all students.

Table 7: Summary of Policy and Funding Recommendations and Goals

1. Update State policies to provide support and flexibility for local digital learning innovations.

As North Carolina schools transition to digital-age teaching and learning, legislation and State Board policies developed for more traditional approaches to education will need to continue to be updated. We anticipate that updating will be an ongoing process as schools and districts identify policy barriers to full implementation of their digital learning initiatives as they implement innovations in areas such as strategic staffing, mastery-based advancement, revised scheduling, and other innovations. In order to achieve the goals of: (a) School and district leaders reporting that State legislation and policies support innovation and that barriers have been removed; and (b) North Carolina being frequently cited as a national leader in digital learning innovations, the State should take the following actions:

a. Transition from textbook adoption to digital education resource adoption processes.

Session Law 2013-12 requires that schools transition from textbooks to digital learning resources as the primary curriculum materials by 2017. This transition not only impacts the materials themselves but also the manner in which they are adopted and reviewed. Currently, the state's Textbook Commission considers new texts for one core content area each year, so that texts for each content area (English, science, mathematics, social studies, arts education, world languages, health, etc.) are scheduled for review every five years. In a world of fixed printed media, this process and schedule work well; in a world in which content changes constantly, the State will need to consider new approaches to adoption of official texts.

In particular, the State will need to consider changes in the following areas:

- Modification of General Statute 115C-85 (Definition of a Textbook)
- Modification of General Statutes 115C-86 through 115C-102 (Textbook Adoption)
- Revision of textbook adoption process policies
- Revisions to the State's process for legal review of digital content acquisition
- Reconciliation of multiple current State-sanctioned content vetting and purchasing processes (e.g., Textbook Commission, North Carolina Virtual Public School, and Learning Object Repository)

We recommend appointment of a working group of educators and state officials to develop the standards for digital learning resources and the process for reviewing and selecting them for statewide adoption. In addition, this working group should consult with the group charged with developing the collaborative procurement process (recommended in previous sections) to ensure that the selection of digital learning materials aligns with that process. The existing Textbook Commission process provides a valuable model, but it must be updated to reflect the flexible, interactive, and continuously updated nature of digital learning resources. Further information is provided on the NC Digital Learning Plan web site (http://ncdlplan.fi.ncsu.edu/).

b. Require integration of plans for digital learning into school and district improvement plans.

In order to encourage integration of digital learning into all relevant aspects of schooling, we recommend that State Board of Education policy require incorporation of strategies for implementing digital learning into district improvement plans and strategic plan, rather than as part of a separate plan. These expanded district improvement and strategic plans should incorporate data from the NCDLC Rubric self-assessment, which districts should continue to complete annually, by addressing how the district plans to progress along each dimension of the Rubric.

c. Change licensure/re-licensure and educator and administrator evaluations to incorporate digital learning competencies for teachers and school administrators.

NC SL2013-11 requires the State Board of Education to develop and implement digital teaching and learning standards for teachers and school administrators by July 2017. We recommend that, as part of their implementation, the State Board of Education require that the competencies: (a) align with the elements of digital-age learning that are foundational to the NC Digital Learning Plan (see Figure 1), as well as with the national standards developed by the International Society for Technology in Education (ISTE); (b)

are supported by a system of competency-based measures that assess whether teachers and administrators meet these standards, rather than by requirements for specific courses or workshops; and (c) at an appropriate time, are incorporated into the teacher and administrator evaluation systems and the requirements for teacher licensure.

d. Require that LEAs provide tools for all educators, students and parents that support major curriculum, assessment, and learning management functions.

While PowerSchool and the True North Logic Teacher Evaluation system are mandatory and made available without cost to districts and schools, districts and charter schools can choose whether to use the other components of Home Base. In order to ensure equity of access to digital resources throughout the State, we recommend a State Board of Education policy that requires that all teachers have access to a learning management system, formative/benchmark assessment system and item bank, online curriculum materials, and a portal to provide information to students and parents. Districts can either employ the tools provided as part of Home Base or, if they prefer, employ other systems that provide the core learning management, assessment, curriculum, and communication functions required for digital-age teaching and learning. If a district selects a third-party system, it should be standards-compliant and be able to integrate securely with PowerSchool. The NCDLC will develop guidelines and template RFPs for selection of third-party systems.

e. Provide districts and schools with more flexibility for hiring Instructional Technology Facilitators.

Research in North Carolina and elsewhere has identified the role of the Instructional Technology Facilitator (ITF) as critical to the success of digital learning initiatives. However, according to 2015 Annual Media and Technology Report (AMTR) results, only 16.5% of schools have a full-time ITF, and only 13.9% have a part-time ITF. Superintendents have identified current licensure requirements for ITFs as a barrier to filling this role in their schools—they can identify individuals who they believe have the expertise but not the coursework required for licensure, since such expertise usually is obtained experientially rather than through formal coursework. We recommend that the State move to a competency-based credential for this role. Doing so would provide flexibility for district and school leaders to hire people with the necessary skills in these critical positions and allow educators greater flexibility for demonstrating their ability to serve in that role. The State Board of Education also should consider allowing teachers who move into the ITF role to retain their current salaries and bonuses (e.g., for National Board certification), to further reduce barriers to moving the best candidates into ITF positions.

f. Allow LEAs to apply for specific policy waivers to support their digital learning initiatives.

As recognized by other state digital learning policies (such as Colorado's Innovation Schools Act, Florida's District Innovation School of Technology Program, and Kentucky's Districts of Innovation), and as noted by groups like the Alliance for Excellent Education, allowing LEAs to apply for specific policy waivers allows states to learn which policies are most in need of revision or elimination as part of the transition to digital learning. For example, a district might request greater flexibility in school calendar guidelines or in how schools allocate and use staff resources. The State Board of Education should take

initial responsibility for reviewing waiver requests, with input from the NCDLC leadership team, Educators' Steering Group, and/or Advisor Board when their input would be helpful.

2. *Provide guidance to help educators address privacy, security, copyright, and responsible use issues.*

While schools have long had to address issues such as bullying, plagiarism, inappropriate materials, test security, and confidentiality of student data, the tools of the digital age require new approaches to the new ways in which these issues can come about with digital-age information and communications tools. The following resources will help local educators address these areas of concern to achieve the goals that schools have minimal problems with the misuse of digital technologies and have structures and systems in place to effectively address any issues that do occur.

a. Recommend legal language to LEAs for inclusion in security and privacy clauses in contracts.

Data security and data privacy are critical components to the success of many aspects of the digital learning plan, and past and current legislation emphasizes the importance to the State of ensuring that security and privacy. The state's contracts with third-party vendors for various components of the North Carolina Education Cloud services include specific language, which has been carefully developed and reviewed by state technology and legal staff, about expectations for data security and privacy. We recommend that the State Board of Education require district and school contracts for digital tools that involve student and/or staff data to include specific legal language for security and privacy clauses, based on the language used in the NC Education Cloud contracts. Further information is provided on the NC Digital Learning Plan web site (http://ncdlplan.fi.ncsu.edu/).

b. Develop recommended guidelines for firewalls and filters across LEAs.

For student safety and security, and to meet CIPA (Children's Internet Protection Act) and FERPA (Family Educational Rights and Privacy Act) requirements, schools and LEAs across the state have established firewalls and filters to prevent access to certain Internet content (for example, many schools block access to YouTube). Meeting these requirements places both legal and technical burdens on LEAs and schools and, in some cases, the firewalls and filters end up preventing students and teachers from accessing appropriate and valuable educational resources. While decisions about what material is and is not acceptable for use in a school ultimately is a local decision, the state can promote more equitable access to content for all students through the development of a uniform set of baseline recommended access guidelines. NCDLC will convene a working group of educators and individuals with legal and technical expertise to develop a set of proposed guidelines that will help districts meet CIPA and FERPA requirements while still retaining local decision-making authority over appropriate online access.

c. Implement rules for copyrighting and using digital resources intellectual property developed by North Carolina educators, based on Creative Commons license standards.

We recommend that the State Board of Education require that any instructional materials and resources developed by LEAs, schools, or individuals using state funds or resources

be released publicly as OER under a Creative Commons CC-BY-NC-SA 2.0 license. This license allows users to use, modify, and remix materials, provided that the use is non-commercial, that the original author receives attribution, and that the new work is shared under identical terms.

3. Develop new State and local funding models to support and sustain digital-age learning.

Digital-age education will need funding models that differ from those for traditional education in order to support the technologies, staffing, and education resources necessary for effective digital learning. To date, districts have reallocated existing funding and used one-time grants and donations to fund technology purchases and other costs of their digital learning transitions, but issues of sustainable funding remain. This is an area of significant challenge that will require further analyses, planning, and decision-making at the State and local levels in order to ensure sustainable funding that allows for long-term planning in all districts and charter schools. To address this need, we recommend the following:

a. Maintain all current funding streams related to digital learning.

The State's conversion to digital learning will change the ways learning takes place statewide, but it will not change the types of funds that will be needed to support that learning. The most important funding streams for LEA digital learning have been funding for PRC 025 (distribution of Indian Gaming funds), PRC 073 (School Connectivity), PRC 015 (School Technology), PRC 130/Fund Code 7104 (State Textbook Fund), and PRC 061 (Classroom Materials/Instructional Supplies/Equipment).

During the 2013-14 session, the General Assembly took steps to support LEAs as they work to get the most out of their funding by granting extensive fund transfer flexibility to LEAs that allow them to make local decisions about where some of their funds can be best allocated. In addition, the General Assembly's current proposed expansion of the State Textbook Fund—both in terms of the amount of funding and of the designation of that fund's use via an expanded title ("Textbooks and Digital Resources")—is a critical next step.

b. Establish a Digital Learning Funding Working Group.

As noted above and as emphasized by school leaders across the State, one of the most challenging components of North Carolina's transition to digital-age learning will be identifying sustainable funding sources—federal, state, local, public, and private—for each element of the transition. Establishment of a Digital Learning Funding Working Group can provide an important resource to state and local governments as they work to identify ongoing funding sources. Membership in this Working Group should include representation or appointments from the State Board of Education, the General Assembly, the Office of State Budget and Management, the Office of the Treasurer, traditional school districts and charter schools from urban, suburban and rural areas, and Friday Institute Digital Learning Plan staff.

This Working Group should be tasked with developing sustainable funding mechanisms for LEAs for digital learning infrastructure, networking, devices, and staffing, with an initial report submitted to the Joint Legislative Education Oversight Committee by January 2017. Further information about specific short-term and long-term funding recommendations for this Group to consider are provided on the NC Digital Learning Plan web site (http://ncdlplan.fi.ncsu.edu/).

c. Seek additional funding from federal agencies, foundations, and private sector organizations.

Progress in digital learning in North Carolina has benefited from funding from sources other than the State budget, going back to the series of United States Department of Education Enhancing Education Through Technology grants that provided funding for Project IMPACT. Most significantly, the $400 million Race to the Top Grant provided support for the development of Home Base and the Cloud Computing Initiative, and many districts used their local shares of the grant to support technology purchases. The federal E-Rate program has been a major factor in funding school connectivity and, with the "modernized" program announced this year, will support within-school networks as well. The Broadband Technology Opportunities Program (BTOP) grants from the Federal Communications Commission (FCC) have supported North Carolina's efforts to make broadband access available in rural communities. School districts have received support through federal grant programs, such as the United States Department of Education's Investing in Innovation program. As noted elsewhere in the proposal, the Golden Leaf Foundation has provided grants for digital learning initiatives in many of North Carolina's economically distressed counties. Private foundations, including Burroughs Wellcome, Gates, Hewlett, Oak, Carnegie, and others, have provided support for relevant programs in North Carolina schools, universities, and non-profit organizations. SAS, CISCO, Lenovo, Qualcomm, BB&T, and other companies have contributed to state and/or local efforts.

NCDLC will seek additional funding opportunities to support expansion of the statewide work, and collaborate with school districts, colleges and universities, state agencies, and non-profit organizations to support their efforts to obtain grants and gifts to further regional and local efforts.

Provide additional supports to ensure equity of digital learning opportunities for all students.

Equity in digital-age education involves more than just ensuring that all students have devices and access to the Internet in school. Equity also requires that all students have teachers who are well prepared to make effective use of digital learning, high-quality educational resources, and the types of personalized, anytime-anyplace learning experiences described in Figure 1 on page 2. Addressing issues of equity needs to be embedded in all aspects of digital learning initiatives, since access to digital learning must be considered part of the State's responsibility to provide a sound basic education for all students.

Actions Steps and Metrics

	Year 1	Year 2
Action Steps	• Form Digital Learning Resource Review and Selection Work Group (SBE) • Formalize requirement for district biennial completion of NCDLC Rubric (SBE) • Complete development of digital teaching and learning standards for teachers and school administrators (SBE) • Develop guidelines and template RFPs for use by districts that choose to contract with third-party data system providers (NCDLC) • Form ITF Work Group (SBE) • Develop policy for district waiver requests related to digital learning (SBE) • Form Data Security, Data Privacy, and Online Safety Work Group (NCDLC) • Form Copyright and Fair Usage Work Group (SBE) • Form Digital Learning Fund Working Group (multiple agencies) • Identify potential digital learning funding opportunities (NCDLC) • Identify specific equity issues across and within districts, to inform plans to address them.	• Adopt approved Digital Learning Resource Review and Selection Work Group recommendations • Formalize requirement for incorporation of digital learning plans into required school and district improvement plans • Pilot incorporation of digital teaching and learning standards into the Educator Evaluation System • Require district adoption of either all Home Base components or equivalent third-party component • Pilot ITF Work Group recommendations for ITF licensure • Formalize and approve recommended legal contract language for inclusion in data security and privacy clauses • Identify specific equity issues across and within districts, to inform plans to address them

Metrics	• ITF licensure requirements and compensation recommendations submitted to SBE by June 2016 • Digital learning waiver request policy submitted to SBE for consideration by June 2016 • Digital teaching and learning standards for teachers and school administrators submitted to SBE by October 2016 • Copyright and fair use recommendations submitted to SBE by October 2016 • ITF licensure requirements and compensation recommendations approved by SBE by October 2016 • Digital learning waiver request policy approved by SBE by October 2016 • Digital learning resource review and selection recommendations submitted to SBE by December 2016 • Data security, data privacy, and online safety policy recommendations submitted to SBE by December 2016	• Digital learning sustainability report submitted to JLEOC by January 2017 • Digital learning resource review and selection recommendations approved by SBE and submitted to JLEOC by March 2017 • Digital teaching and learning standards for teachers and school administrators approved by SBE by March 2017 • Copyright and fair use recommendations approved by SBE by March 2017 • Data security, data privacy, and online safety policy recommendations approved by SBE by June 2017

REGIONAL AND STATE SUPPORT SYSTEMS

A system of supports at both the regional (Figure 31) and State levels is essential to ensure progress across all schools and equity of opportunity for all students. Relevant findings and recommendations are described below.

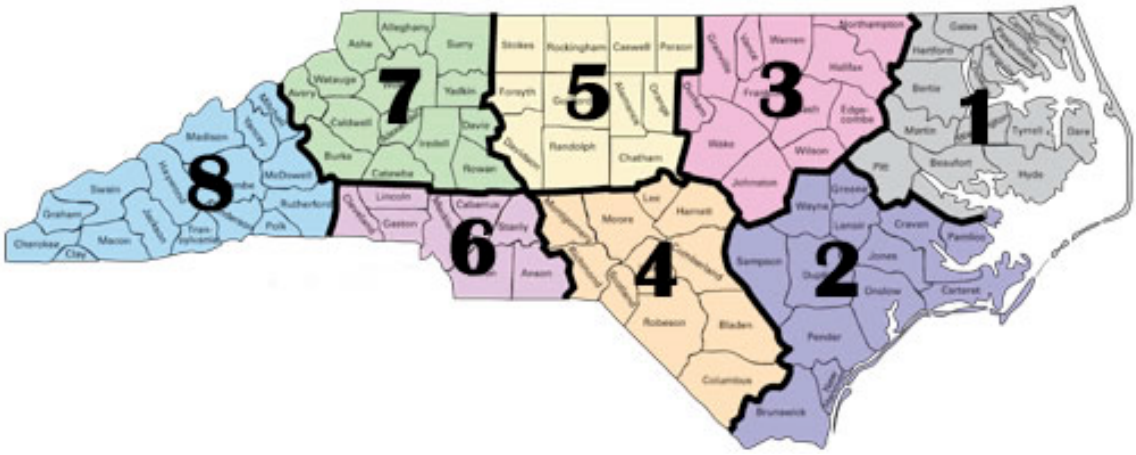

Figure 31: North Carolina Education Districts

Findings

1. Successful digital learning programs are developed by local education leaders to meet local needs and conditions, while taking advantage of lessons learned elsewhere and leveraging State-supported innovations, resources and guidance.
2. Lessons from exemplary programs already underway in North Carolina are highly valued by education leaders, and have been influential in expanding the use of digital learning. For example, site visits to Mooresville Graded School District and the documentation of their digital transition initiative has influenced many other North Carolina districts.
3. Supports need to be targeted to the specific context, needs, and prior progress in each setting; there is not a "one-size fits all" approach.
4. Regional support structures are valuable and preferred by local educators to having all the supports provided centrally from Raleigh.
5. Schools and districts needed ongoing, on-the-ground support that combines technical assistance, planning and implementation guidance, along with blended (face-to-face and online) professional learning opportunities.
6. Districts and charter schools often lack adequate start-up funding for the initial costs of planning, implementing, and providing instructional support and technical staff for digital learning initiatives. Savings through regional collaborations are critical.
7. In many initiatives, further attention is needed to long-term planning and continuous improvement processes. Digital learning initiatives are often started without sufficient long-term planning to maintain, evaluate, improve, and extend the initiative.

8. There is expertise across the State, in K-12 schools, community colleges, UNC and Independent Colleges and Universities, Regional Education Service Agencies, museums, non-profit educational organizations, and private sector businesses that can be leveraged to further digital learning statewide.
9. Schools and districts that are successful pay careful attention to informing and engaging their communities to make sure they have support from parents, business and community leaders, and the local taxpayers overall.

Recommendations

Based upon our experiences with digital learning initiatives throughout North Carolina and elsewhere, the research on digital learning transitions, and the findings summarized above, we make the recommendation summarized in Table 8 and described in further detail below.

Recommendations	Goals
• Establish the North Carolina Digital Learning Collaborative to manage the recommended State programs, with Executive Committee representation from NCDPI; the Friday Institute; the Golden LEAF Foundation; and the Principals, Superintendents, and School Boards Associations; and Advisory Board representation from all stakeholder groups.	• Local education leaders report that statewide systems provide effective support for digital learning initiatives. • All districts and schools advance on each dimension of the Digital Learning Progress Rubric.
• Establish regional digital learning networks to support digital learning initiatives and foster collaborations.	• Local education leaders report that regional systems provide effective support for digital learning initiatives.
• Implement a digital learning progress dashboard and data-informed continuous improvement processes.	• Multiple measures demonstrate ongoing increases in statewide progress in digital learning and student achievement.

Table 8: Recommendations and Goals for Regional and State Support Systems

1. ***Establish the North Carolina Digital Learning Collaborative to manage the recommended State programs, with Executive Committee representation from NCDPI; the Friday Institute; the Golden LEAF Foundation; and the Principals, Superintendents, and School Boards Associations; and Advisory Board representation from all stakeholder groups.***

The NC Digital Learning Plan recommends a diverse set of activities to guide and support districts and schools in their transitions to digital learning. These activities address the five areas of the Digital Learning Progress Rubric: leadership, professional learning, content and instruction, technology infrastructure and devices, and data and assessment. Providing the needed guidance and support to the 115 districts and

growing number of charter schools will require the involvement of many organizations and people to bring together the requisite expertise and resources. Therefore, a strong management structure will be essential for what we have labeled the NC Digital Learning Collaborative (NCDLC). Our recommendations for the overall management and oversight structure are summarized in Figure 32 and described below.

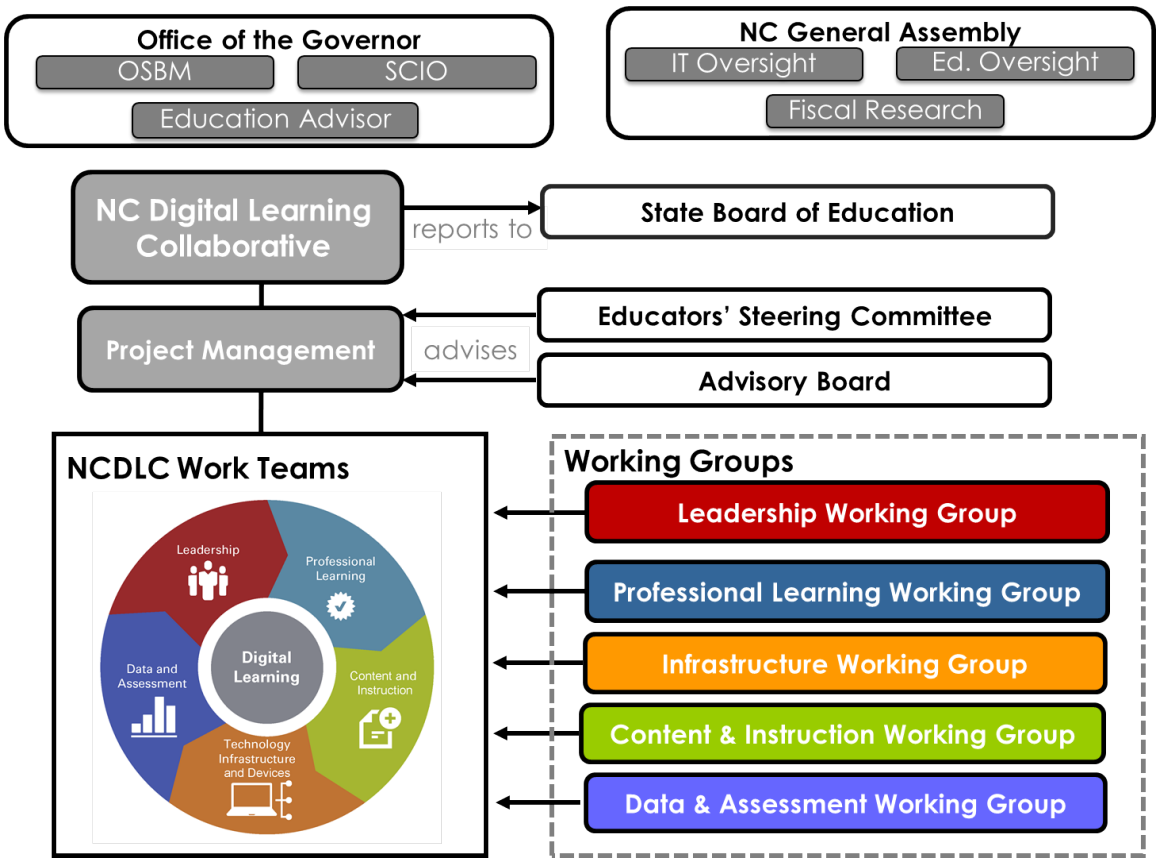

Figure 32: Proposed NCDLC Management and Governance

Oversight

Top-level oversight of the NC Digital Learning Collaborative will be provided by the State Board of Education, which is charged with fulfilling the expectations framed by the North Carolina General Assembly. NCDLC will report on a timely basis about its plans, activities and accomplishment to the State Board of Education and, upon request, to legislative oversight committees and to the Office of the Governor or their designees.

Program Management

Program management for the NCDLC provides day-to-day leadership for operations and supporting projects. An overall leadership team will have representatives from the Friday Institute, NCDPI, the Golden Leaf Foundation and the professional organizations of principals (NCPAPA), superintendents (NCSSA) and local school board members (NCSBA). The leadership team will provide direction and oversight to the NCDLC Director and staff. The staff will manage the work teams; provide support to the advisory,

steering, and working group structures; and guide the work of other partners and consultants.

While the Friday Institute, NCDPI, Golden Leaf Foundation and professional associations will collaborate on all aspects of NCDLC, we anticipate that each organization will focus on specific areas of work, based upon prior work and expertise. While details will need to be worked out, starting assumptions for each organization include the following:

The Friday Institute will continue to support the work on technology infrastructure, based upon the Institute's prior and current work on the School Connectivity and Cloud Computing Initiative. It will also play a central role in implementing the leadership professional learning and support recommendations, based upon the Institute's work in North Carolina with the North Carolina Association of School Administrators; the Leading Blended Learning national program; work with the U.S. Department of Education Future Ready Schools initiative; and other programs for school and district leaders. The Friday Institute will also support the evaluation and documentation of innovative school and district programs and development of the Digital Learning Dashboard, building upon the Institute's expertise in program evaluation. The Friday Institute will also leverage its work on Massive Online Open Courses for Educators.

NCDPI will lead the continued work on Home Base and the provision of professional development and support for the Home Base tools. NCDPI will also lead the development of resources to support professional development for teachers, and the development of guidelines and processes for the selection and procurement of digital learning materials. NCDPI will also continue to provide regional digital learning consultants and work directly with RESAs. In addition, NCDPI will lead the work on developing digital learning competencies for teachers and administrators.

The Golden Leaf Foundation will take primary responsibility for the grant initiatives described in the following recommendations, building upon their successful history of implementing, operating and monitoring grant programs for schools and districts, including many specifically focused on digital learning in K-12 schools. Golden Leaf has agreed to align its relevant grant initiatives with the Digital Learning Plan, and to use available funding to support the aligned grants.

The professional organizations will each have primary responsibility for coordinating professional development for its members, and providing up-to-date information and resources relevant to its members.

Educators' Steering Committee

An Educators' Steering Committee comprised of representatives of LEAs and charter schools will have responsibility for ensuring that NCDLC addresses the goals and needs of the LEAs and charter schools in moving to digital-age teaching and learning. The Educators' Steering Committee will set priorities, monitor the work, and guide revisions in the work plan as needed, while ensuring that NCDLC addresses the goals and requirements set forth by the State Board of Education and Legislature. The Educators Steering Committee will ensure that educators have a strong voice in the implementation of the Digital Learning Plan and that NCDLC operates according to the guiding principles described above.

The Educators' Steering Committee will have 20-25 members. A pool of potential members will be developed through recommendations from the Chair of the State Board of Education, State Superintendent of Education, Executive Director of the Friday institute, President of the Golden LEAF Foundation, and Directors of NCPAPA, NCSSA, and NCSBA. The final set of members will be selected by the NCDLC leadership team from those recommended to ensure that the Committee is representative of districts and schools across the eight education regions of the State.

Advisory Board

We also recommend continuing the Stakeholder Advisory Board that was formed for the Digital Learning Plan, to provide input from all stakeholder groups. The Advisory Board is comprised of North Carolina education, government and business leaders who provided input on the Plan from their multiple stakeholders' perspectives. The list of current members of this advisory board is available on the NC Digital Learning Plan website.

Working Groups of K-12 Educators

During the planning process, the Friday Institute convened working groups of educators from K-12 districts around specific topics and questions, such as developing the digital learning competencies for teachers and administrators, defining educational return on investment, and integrating digital learning with personalized, competency-based and student centered approaches to learning and advancement. We found that convening groups of educators, selected for their expertise on the particular topic, for intensive one or two day meetings, to be very effective in furthering thinking about complex issues. We recommend continuing to convene working groups of educators to do in-depth analyses of selected topics as needed during the work of NCDLC.

Partnerships

In order to meet the goals of the NC Digital Learning Plan and follow the guiding principles to *leverage existing innovations, expertise and resources from throughout North Carolina* and *build leadership capacity throughout the State,* a number of partner organizations will be needed. While no final decisions have been made about partnership agreements, the following describes likely partners and potential roles:

- Local Education Agencies and charter schools that are leaders in the transition to digital learning to provide site visits, lessons learned, and consulting to other districts and schools interesting in implementing programs based upon the existing models of innovation.
- The Regional Education Service Agencies (RESAs), universities, community colleges, and other organizations to coordinate Regional Support Networks.
- NC School Superintendents Association (NCSSA), NC Principals and Assistant Principals Association (NCPAPA), and the NC School Boards Association (NCSBA) for contributions to leadership development programs for superintendents, principals and local school board members, based upon their existing programs.
- NC New Schools for the engagement of early college high schools and to connect their education design principles and their work developing and testing models of competency based education with digital learning.

- NC School of Science and Mathematics (NCSSM), for open education resources in STEM curriculum and to integrate the virtual programs for students and teachers that they already provide.
- NC Center for the Advancement of Teaching (NCCAT) for professional learning programs for teachers in the uses of digital learning in the classroom.
- MCNC for network and related infrastructure engineering support to LEAs and charter schools.
- Others to be determined.

Stakeholder Engagement

In developing this Digital Learning Plan, Friday Institute and NCDPI staff conducted presentations, focus groups, town hall meetings, webinars, and other information sessions with teachers, administrators, parents, students, school technology directors, local school board members, business leaders, legislators and other stakeholders. These sessions enabled us to learn how different members of our school communities both see great potential and have serious concerns about the use of digital technologies in education

The success of the statewide transition to digital learning depends upon the support of stakeholders throughout the State. That requires having responses to the very real concerns about digital learning that are well considered and well communicated by State and local education leaders and by teachers. A communications strategy to inform educators, parents and other community members about the transition to digital learning, and to respond to their concerns, is essential. This strategy should, ideally, involve State and local elected officials; State Board of Education members; the superintendents, principals, teachers, charter school, and parent associations; local school administrators and teachers; business leaders; and the students themselves. NCDLC will form a communications group comprised of representatives of these constituents to develop a strategy and resources to inform and engage all of these groups.

2. Establish Regional Digital Learning Networks to support digital learning initiatives and foster collaborations.

Across the eight education regions of North Carolina, there are many potential sources of support for K-12 digital learning initiatives. These include the Regional Education Service Agencies (RESAs), universities, community colleges, LEAs that have the expertise and interest to support other districts, museums and other informal learning centers, nonprofit organizations and private sector businesses, as well as regionally-based consultants and services from NCDPI. Digital Learning Support Networks embedded in each region, led by people who are knowledgeable about and connected in the region, will be important in supporting the successful and sustainable implementation of digital learning throughout the State. These Networks will enable NCDLC to implement the guiding principles to *leverage existing innovations, expertise and resources from throughout North Carolina* and *build leadership capacity throughout the State*, as well as be critical to the principle of *focus on equity of educational opportunity for all students throughout North Carolina.* They will support collaborations around professional learning, educational resources, technology infrastructure, teacher

preparation, local policy development, and other functions needed to support digital learning transitions.

Each region has its own strengths, resources and needs. Therefore, we recommend that the support structure for each region be established through a competitive grant program that will allow partnerships from each region to propose how they would address the supports needed in their region, within the guidelines of the grant requirements. This would allow, for example, a partnership of a RESA, community college and several districts to comprise the regional support network in one region, while in another it might be a partnership of a university, non-profit organization, district and charter school.

The Regional Support Networks grants will focus on the following priorities:

1. Professional development programs for teachers and administrators;
2. Cross-district coordination of collaborations around digital learning planning, educational resources, professional learning communities, program evaluation, and other areas to meet regional needs;
3. Coordination of site visits and more formal professional learning study tours to exemplary schools and convening of professional learning groups with common interests across districts and charter schools;
4. Documentation of exemplary practices and lessons learned within the region, to be shared throughout the State through the Digital Learning Toolkit described in the Local Digital Learning Initiatives section above;
5. Engineering support for school network infrastructure planning and maintenance;
6. Legal support for contracting, addressing responsible use requirements, data privacy and security issues, and other needs requiring specialized legal expertise related to digital learning;
7. Activities to support charter schools in their region in developing effective digital learning programs;
8. Work with regional teacher preparation programs on integrating preparation for teaching in digital learning schools into pre-service programs; and
9. Other functions as determined by the needs of the schools and districts in the region.

NCDLC will develop the grant guidelines, request for proposals, and review guidelines, as well as select members of the grant review panel, with input and review from the Educator Steering Committee and Advisory Board. The Golden Leaf Foundation will play a central role in this and other NCDLC recommended grant programs. The grant requirements will strongly encourage collaborations among organizations in the region, with one organization serving as the coordinator and fiscal agent. We recommend that grants be for two-year periods, renewable based upon performance in meeting the goals defined in the grant proposal. Annual grants should be for at least $400,000 per region.

3. Implement a digital learning progress dashboard and data-informed continuous improvement processes.

The NC Digital Learning Plan calls for a dynamic change in the state's overall approach to education. As such, results should be tracked and shared with all stakeholders on a regular basis. This recommendation calls for a comprehensive continuous improvement approach that leverages pertinent data sources at the state, district, and school-levels to provide a systemic understanding of progress in local digital learning activities, as well as about the overall NCDLC effort. The approach will leverage key data points over time, and requires systems thinking and consistent communication and flexibility between and across levels, as it is not known in advance what necessary modifications the data will reveal.

A *North Carolina Digital Learning Dashboard*, aligned to the elements of the NC District Digital Learning Progress Rubric, will fulfill this need and provide data to inform continuous improvement processes at the school, district, regional and state levels, as well as future policy and funding decisions. Within the past year, two education-focused dashboards have been developed in our state and will serve as a model for this work - the UNC Teacher Quality Dashboard and the NC School Report Cards Dashboard. The NCDLC dashboard will serve as a public, interactive, web-based tool used for analyzing and displaying data about local and statewide digital learning efforts. It will contain performance indicators and other information at the school, district and state levels across a range of factors including leadership, professional learning, content and instruction, and data and assessment. This structure will enable NCDLC to share findings with and across districts, aggregated to the state-level, and with the broader national education community.

Action Steps and Metrics

	Year 1: Design	Year 2: Develop and Pilot
Action Steps	• Vet proposed NCDLC logic model with NC education stakeholders • Develop continuous improvement questions • Work with NC education stakeholders to identify new and existing data sources aligned to logic model and rubric • Coordinate and partner across agencies responsible for collecting and analyzing data • Revise or develop data sources as needed • Identify appropriate reporting functions NC education stakeholders • Write specifications, workflows, plan for development of the NC Digital Learning Dashboard	• Pilot data collection and analysis activities • Conduct validity and reliability analysis of data sources • Vet data collection and analysis activities with NC education stakeholders • Pilot just-in-time report functions • Establish contracts to implement the specifications to build the platform for the NC Digital Learning Dashboard • Pilot data integrations, dashboard interface and reporting functions • Collect data from the field on usability of dashboard
Metrics	• Comprehensive continuous improvement work plan approved by NCDLC Steering Committee and NC State Board of Education	• Contracts for dashboard development approved by NCDLC Steering Committee and NC State Board of Education • Findings and recommendations from pilot studies have been submitted to the NCDLC Steering Committee and NC State Board of Education

Action Steps, Metrics, and Budget for NCDLC Continuous Improvement Efforts

BUDGET CONSIDERATIONS

The transition to digital-age strategies, resources and tools in education, as in every industry, requires investments. In education, the return-on-investment will be in terms of increased student engagement and achievement, graduation rates, and preparation for college, careers and citizenry. While these do not provide a short-term financial return, the long-term financial benefits to the State of having an updated and improved education system are very significant.

The budget for a comprehensive transition to digital learning across all public schools must include the costs of the school network infrastructure, devices for all students and teachers, digital content, staffing to support the technologies and educational uses of them, professional development for teachers and administrators, and state and regional supports for the transition process. The full transition will involve funding from multiple sources, including the State, districts, federal agencies, foundations, and the private sector. Much of the funding can come from existing budgets; but additional investments will also be required.

Budget requirements in some categories are well defined. For example, based upon detailed analyses and past experience, completing and sustaining the networking infrastructure for every public school will require $94 million per year, of which only $32 million per year needs to be from the State. Of this amount, $19.9 million has already been allocated for the School Connectivity Initiative. The total $32 million will leverage approximately $62 million of annual investment from the FCC E-Rate program, so the State's cost will be about $20 per student.

Another major cost is devices for students and teachers. Here there are a range of options, including tablets, Chromebooks, PC laptops and Apple laptops, with significantly different costs, currently ranging from $70 per year for a Chromebook to $182 per year for an Apple MacBook.[18] Schools may select different devices for different grade levels, or begin providing devices for every student at grade 3 or 4. One set of assumptions, based upon current costs and ratios of types of devices, a 4 year refresh cycle, and devices for all K-12 students, results in an estimated annual cost of $155 million, or about $100 per student and teacher. If devices are provided only to students in grades 4-12, the total cost is reduced to $129 million. To date, districts have funded the cost of devices, often with Title I federal funds combined with grants or other one-time funds. Both the sustainability of funding for devices and the ability of all districts to provide devices are of concern moving forward.

For digital content, we estimate a total cost of $90 million per year, or $60 per student, based upon the current budgets of leading digital learning districts. This is more than the current State budget for textbooks and digital learning resources.

Professional development funding at the State and local levels can be reallocated to digital learning, as is already being done. We recommend additional State funding of $6 million per year to support the specific Human Capacity recommendations in this Plan. We also recommend that $6 million be allocated annually for the recommended

[18] The costs include additional essential items per device, such as a protective case and security software.

Regional and State Support Structures, in addition to existing funding that can be allocated to those supports.

Instructional technology facilitators (ITFs), media coordinators, and technicians provide core functions necessary to sustain high functioning digital learning initiatives in every school. According to 2015 AMTR data, over 80% of NC schools report employing a media coordinator, while only 16% report employing an instructional technology facilitator, and barely 10% have a dedicated technician. The deployment of human resources to deliver these core functions is very much a strategic staffing decision that is based on district size, distance between schools, vendor relationships, regional supports available, access to qualified candidates, and of course funding. Budgeting for ITFs and related digital learning support functions requires further consideration that is built upon district-wide staffing models as a whole, not simply adding a single role in isolation.

The final recommendation requiring funding is to support Model Digital Learning Initiatives. The Golden Leaf Foundation has supported these in a number of economically distressed counties, and plans to continue to do so. Other districts have obtained grants and some have reallocated their available funding for digital learning initiatives, often supplemented by some private sector support. State funding to support local innovations and scaling model programs would move the digital learning transition forward more quickly.

FURTHER INFORMATION: NC DIGITAL LEARNING PLAN WEB SITE

To prepare this report, the Friday Institute team analyzed relevant research and data, reviewed many national and state reports, and prepared summaries of relevant findings. We also drafted policy briefs, logic models, and other resources that provide more background and details for a number of the recommendations in this document. These materials are all available on the NC Digital Learning Plan web site (http://ncdlplan.fi.ncsu.edu/), along with this Plan and a 12-page summary.