

A Progress Report
from the
North Carolina e-Learning Commission
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Submitted to the
North Carolina Education Cabinet

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Executive Summary

The North Carolina e-Learning Commission is dedicated to creating and promoting a collaborative online learning environment that promotes student achievement, business success, economic stability, and lifelong learning for every citizen of North Carolina. Although building this e-learning environment will require a substantial initial investment, over time it can provide high-quality, personalized education while helping to reduce costs for buildings, maintenance, travel, and other operations. By offering anytime, any-place learning, it can extend and equalize the educational opportunities available to citizens throughout the state.

Leveraging the e-learning environment that already exists in North Carolina requires the active participation and collaboration of many players. To ensure that this environment works smoothly and efficiently, we must expand our existing statewide network to educational institutions at all levels. To simplify e-learners' search for appropriate instruction, we must organize access to e-learning opportunities in an understandable, user-friendly way. To fully use the potential of e-learning technologies, we must foster the development and dissemination of high-quality online learning resources. To ensure effective interface between instructors and e-learning students, we must provide high-quality professional development for our educators. To ensure that the education we provide through learning is of the highest quality, we must develop consistent e-learning standards and assessment methods for course development and delivery.

This report of the North Carolina e-Learning Commission to the North Carolina Education Cabinet and the Joint Legislative Education Oversight Committee of the North Carolina General Assembly describes the existing e-learning infrastructure and environment of North Carolina, highlights recent improvements, and suggests collaborative ways to move North Carolina's education sectors toward a more seamless learning environment, a development that can bring important benefits to North Carolina, both educational and economic.

Recommendation 1: The North Carolina Education Cabinet

Establish a full-time staff to communicate and meet with the members of the North Carolina Education Cabinet members or their designated staff to coordinate and study education issues.

Recommendation 2: e-Learning Standards

Ensure that quality standards and policies are in place for e-learning across PreK-20.

Recommendation 3: NCREN

Endorse NCREN as the statewide education network for education PreK-20.

Recommendation 4: Center for Online Professional Development

Develop a North Carolina Center for PreK-20 Online Professional Development to explore using online delivery methods to prepare teachers, faculty, and administrators to use technology to enhance teaching, learning, assessment, communications, and management.

Recommendation 5: Technology Collaboration Council

Establish a Technology Collaboration Council to assist in researching and identifying opportunities for collaborative infrastructure solutions.

Recommendation 6: Learning Consumers Council

Establish a Learning Consumers Council to provide input and feedback in order to ensure that the needs of North Carolina's e-learning consumers are effectively met.

Recommendation 7: NC e-Learning Portal

Launch and sustain the production version of the North Carolina e-Learning Portal, a customized Web site that provides access to information about all e-learning resources offered by public and private education institutions in North Carolina.

Recommendation 8: Data Mining and Dynamic Reporting

Develop an aggregated PreK-20 statewide intelligent data-mining and dynamic reporting system that will allow real-time access to information in a format that can be used to assist with decisions on personal learning plans for students, professional development plans for instructors, and resource-allocation decisions for institutions, districts, and entire systems.

Introduction

We live in an information world, a knowledge society revolutionized by technology. In the future, the economic success of businesses, communities, states, and countries around the world will depend on an educated workforce with the skills to function as knowledge workers who can manage and process information, think critically, communicate and collaborate effectively, assimilate primary source information, solve complex problems, and learn continuously.

At a time when successful workers need to be highly educated skilled learners, we are challenged with national data that indicate that one-third of all public school students and nearly half of low-income and minority students fail to graduate from high school. The costs of this failure to educate are significant. Less-educated workers earn lower incomes. Lower incomes mean increased poverty, increased health costs, and increased costs to the taxpayer for public assistance. Thus, the public school problem impacts every aspect of the community and the economy.

And the stakes are getting higher. It is estimated that students graduating today from high school will experience eight to ten different careers during their lifetime. In a world in which the requirements for literacy go beyond reading or writing to include the ability to continuously learn, unlearn, and relearn, we can ensure our economic prosperity and success only if we educate knowledge workers who have the flexibility and learning skills to succeed in a changing and global economy.

To produce such workers, we must be prepared to provide educational opportunities and access to information for our students and citizens any time and anywhere. A logical way to do this is to leverage the technological environment and opportunities open to us to create an adaptable and malleable technology-rich learning environment. Students can use this environment to collaborate dynamically with other students or work in ways that best suit their individual learning styles.

In its role as advisor to the North Carolina Education Cabinet, the North Carolina e-Learning Commission is dedicated to creating and promoting a collaborative online learning environment that promotes student achievement, business success, economic stability, and lifelong learning for every citizen of North Carolina.

Since 2006, when the E-Learning Commission began its work, all of the education sectors in North Carolina have increased their offerings of virtual or e-learning opportunities. There has also been an increase in high school students taking college courses and community colleges and universities sharing degree programs. These collaborations, made possible by technology, are moving the education sectors toward a more seamless learning environment, a development that can bring important benefits for the state, both educational and economic.

It is important to note that e-learning is not a silver bullet. Although it can lead to savings in the cost of buildings, maintenance, travel, and other operations, it also requires a substantial investment in infrastructure, training, and course development. Furthermore, it does not work the same way at every educational level. In the higher education arena, it can sometimes serve as a primary delivery method. At the PreK-12

level, it is more often a supplement or enhancement to traditional “bricks and mortar” public schools.

Furthermore, leveraging the e-learning environment that already exists in North Carolina requires the active participation and collaboration of many players. To ensure that this environment works smoothly and efficiently, we must expand our existing statewide network to educational institutions at all levels. To simplify e-learners' search for appropriate instruction, we must organize access to e-learning opportunities in an understandable, user-friendly way. To ensure effective interface between instructors and e-learning students, we must provide high-quality professional development for our educators. To ensure that the education we provide through learning is of the highest quality, we must develop consistent e-learning standards and assessment methods for course development and delivery.

High-quality e-learning can expand access to education for all North Carolina citizens. Expanding access to e-learning opportunities is one strategy for improving the overall educational attainment of the citizens of North Carolina.

The North Carolina e-Learning Commission

In September 2003 the North Carolina General Assembly enacted General Statute 115C-102.15 to create BETA, the Business Education Technology Alliance, an alliance of key leaders including business, local and state policy makers, and educators. BETA was charged with exploring ways to prepare a globally competitive workforce for the twenty-first century by expanding North Carolina citizens' educational options. Its specific focus has been on instructional approaches that can better accommodate individual and schedule differences, particularly by the use of technology. The alliance has been chaired by North Carolina Lieutenant Governor (now Governor-Elect) Bev Perdue, who was appointed by the chairman of the North Carolina State Board of Education.

To establish a framework for fully integrating technology into PreK-20 education in North Carolina, in January 2005 BETA offered twenty recommendations, which led to the development of "21st Century Goals and Priorities for the State Board of Education," the first state virtual public school, an expansion of the existing statewide research and education network to include the public schools, and the creation of the North Carolina e-Learning Commission.

BETA is required to advise the SBE and report annually on progress toward achieving its recommendations for implementing education technology in the public schools. Based on a BETA recommendation, the State Board of Education, chaired by Howard Lee, and the Business Education Technology Alliance, chaired by Lieutenant Governor Perdue, established the e-Learning Commission.

Definition of e-Learning

E-learning is defined in Session Law 2005-276-Section 7.41:

(b) As used in this section. "E-learning" is electronic learning that includes a wide set of applications and processes, such as, Web-based learning, computer based learning, virtual classrooms, and digital collaboration. It includes the delivery of content via Internet, intranet/extranet (LAN/WAN), audiotape, videotape, satellite broadcast, interactive television and CD-ROM.

There are many reasons for North Carolina to support e-learning, among them its potential to provide efficient, convenient, and fair access to a free public education for students throughout the state. E-learning is a vehicle by which North Carolina can meet its constitutional mandate for a free public education for all by providing educational opportunities for citizens representing all geographic, socioeconomic, and demographic spectrums. Indeed, many North Carolinians already take advantage of online educational opportunities. Increasing access in an organized way is one strategy for improving overall educational levels of the state's citizens, which is important for the state's economic future.

Organization and Operation

The North Carolina e-Learning Commission has twenty-seven members, representing businesses, community colleges, public universities, independent colleges and universities, the Department of Public Instruction, virtual education content providers, superintendents, teachers, technology directors, counselors, and the State Board of Education. (See Appendix A for a list of the current members of the eLC.) The e-Learning Commission is currently led by two co-chairs, Lieutenant Governor (now Governor-Elect) Bev Perdue and Tony Copeland, president and CEO of Longistics, Inc. The remaining twenty-five members serve on one of three subcommittees: Subcommittee on Legislation, Policy, Funding, and Accountability; Subcommittee on Curriculum and Instruction; Subcommittee on Infrastructure.

The themes of academic integrity, accountability, flexibility, and service guide all decisions of the e-Learning Commission. To support the work of the eLC, grants were requested and received from the North Carolina New Schools Project and the Bill and Melinda Gates Foundation.

The eLC reports annually to BETA and the SBE, which report to the Education Cabinet, which in turn reports to the Joint Education Oversight Committee of the North Carolina General Assembly. (See Appendix B for a chart that describes coordinated reporting for organizations supporting e-learning in North Carolina.)

Goals and Recommendations

The short-term goal of the eLC was to recommend to the State Board of Education in June 2005 a strategy for establishing what is now the North Carolina Virtual Public School. The longer-term goal of the eLC was to extend e-learning opportunities to all the citizens of North Carolina by developing a statewide technological and organizational e-learning infrastructure to complement and extend North Carolina's traditional educational institutions at all levels.

In 2006 the e-Learning Commission submitted a report to the North Carolina State Board of Education and the Business Education Technology Alliance. This report, "Worldwide Schoolhouse: A Global Vision for Learning in North Carolina," put forward fifteen formal recommendations. The first two recommendations addressed the eLC's short-term goal of establishing the North Carolina Virtual Public School. The remaining thirteen recommendations outlined actions and principles for building a coordinated and collaborative e-learning environment in the state of North Carolina. (Appendix C provides a matrix describing the first fifteen recommendations of the eLC and progress toward achieving them.) In addition, on the basis of its deliberations in fall 2008, the eLC adds in this report an additional eight recommendations for the consideration of the Education Cabinet.

Accomplishments

The e-Learning Commission achieved its short-term goal when the North Carolina Virtual Public School opened for enrollment in June 2007 and offered courses to over 25,000 students in its first year. The purpose of the NCVPS is to augment high schools students' programs of study by providing courses that students are unable to take at their

local schools. These might include classes for homebound or hospital-bound students; AP and other courses that the local school does not offer; required classes that are already filled at the local school; recovery courses; alternative courses for students who don't do well in traditional class settings, or classes for students who wish to graduate on an accelerated schedule. NCVPS's initial course offerings were only for high school students. In subsequent years course offerings were made available for middle school students. By 2008, NCVPS was offering over seventy-two courses—including Advanced Placement courses, world languages, and credit-recovery courses—to over 25,000 students across the state of North Carolina. Under NCVPS's umbrella, Learn and Earn Online now offers college-credit courses to high school students through the community colleges and/or the UNG i-School.

Meanwhile, the e-Learning Commission has continued to pursue its longer-term goal of extending e-learning opportunities to all the citizens of North Carolina. It has adopted a number of strategies to do this, making formal recommendations to BETA and the SBE. It has made great strides in achieving its goals, most notably by ensuring that every citizen of North Carolina has access to e-learning options, by encouraging cooperation and collaboration among all education sectors in the state, and by providing a gateway to e-learning opportunities in the state through a searchable and customizable portal.

The e-Learning Environment in North Carolina

Under the leadership of Governor Mike Easley, Lieutenant Governor (now Governor-Elect) Bev Perdue, Representative Joe Tolson, Senator Vernon Malone, and the leaders of the state's educational institutions, the state of North Carolina has recently advanced a number of initiatives and organizational changes designed to move North Carolina's education systems toward a twenty-first-century and globally competitive approach. Since many of the initiatives involve the use of technology, these efforts impact the work of the e-Learning Commission. This description of the e-learning environment in North Carolina is taken from the 2008 reports of the e-Learning Commission subcommittees. (Appendix D includes these reports in their entirety. Appendix E lists Internet links to North Carolina e-learning resources.)

The Basic e-Learning Infrastructure

Each school in North Carolina, from PreK-20, has a general technological infrastructure to support communication through e-mail and other Web-based means. Many institutions have adopted electronic course-management systems to support online learning for students on the campus, learning at a distance, and blended courses that use a combination of online and face-to-face instructional learning activities, especially on community college campuses. University and community college campuses also have online support services for registering, paying tuition, and accessing library materials, etc. Campuses have help desks to address both content and technology questions. In some cases, campuses share resources.

The North Carolina School Connectivity Initiative

Before the citizens of North Carolina can reap the benefits of e-learning, they must have access to it. North Carolina has positioned itself as an early adopter of a common-

backbone strategy for providing the necessary connectivity to PreK-20 e-learning. The common-backbone strategy establishes a robust, shared communications network that allows educational content and administrative information to move into, out of, within and between the three levels of education (PreK-12, community college, and college and university). North Carolina is building its PreK-20 network with the existing North Carolina Research and Education Network (NCREN).

The required technical and administrative work to establish the network was seeded by the BETA commission, the e-Learning Commission, the Friday Institute for Educational Innovation at North Carolina State University, the state of North Carolina's Office of Information Technology Services (ITS), MCNC (the organization that operates the NCREN) and many other partners. Lieutenant Governor (now Governor-Elect) Bev Perdue, and the North Carolina General Assembly led the effort to provide funding for the planning, pilot, and implementation phases of a project with the objective of connecting public schools to NCREN. This project has been designated the School Connectivity Initiative. The North Carolina Technology Association recently awarded the School Connectivity Initiative its statewide award for public service as an exemplary collaborative project.

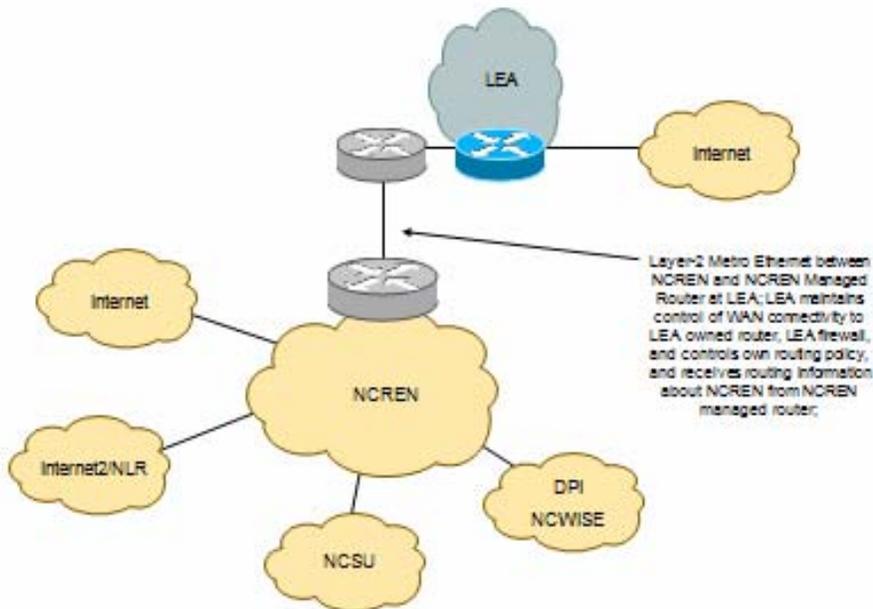
These are the major features of the North Carolina School Connectivity Initiative:

- For networked services delivery through NCREN, network administration, provisioning, and technical support, MCNC will be the principal agent to the PreK-20 community. This allows MCNC to leverage the skills and talents it has developed in working with higher education clients for the past twenty years to support the broader North Carolina education community.
- ITS will be the project overseer for the North Carolina Department of Public Instruction (K-12) and the North Carolina Community College System. ITS has worked with NC State's Friday Institute and MCNC, the operator of NCREN, in an unprecedented public/private partnership, to define the administrative and technical framework by which the 115 PreK-12 school districts (LEAs) in North Carolina and the fifty-eight community colleges in North Carolina will be added to the NCREN backbone.
- At the physical layer of the NCREN network, which is the foundation through which all information passes, ITS and MCNC will act as one organization to maximize efficiency and minimize the expense of the PreK-20 backbone.
- While NCREN will serve as the core of the education network, ITS and MCNC have executed a master agreement that allows both MCNC-owned and ITS-owned technical staff and facilities to be leveraged to follow the most efficient path for delivering PreK-20 backbone services to education entities in the state and to minimize expense of connecting the LEAs and community colleges to the NCREN core.
- Private-sector service providers (led by ATT, Embarq, TimeWarner) will also play a key role in implementing the PreK-20 backbone strategy, by providing local circuits to connect LEAs and community colleges to the PreK-20 NCREN

backbone. This represents significant new business opportunities for the private-sector providers.

Using NCREN as a common PreK-20 backbone ensures that network traffic between individual education institutions and their application and content providers (including the University of North Carolina system, the community college system, independent colleges and universities, DPI, ITS, and other educational institutions) takes the fastest and most efficient path. To implement this local-traffic principle, MCNC worked with existing service providers install an Ethernet-based circuit from each of the 115 LEA central offices to the most appropriate network regional Point of Presence (rPoP). We expect all LEAs in North Carolina to be connected to NCREN by the end of January 2009.

To connect an LEA, MCNC must procure and install the equipment necessary to support network traffic destined for locations within the state's educational institutions through NCREN. For traffic destined for the public Internet, an LEA may choose to route such traffic through NCREN or use its existing Internet service. MCNC will establish a policy for managing this on-net traffic in cooperation with each LEA, with appropriate guidance and consultation of ITS through regular technical meetings. According to its agreement with ITS and DPI, MCNC is responsible for the proper functioning of all circuits and devices installed. The following diagram illustrates this concept.



The implementation of the common backbone at the PreK-12 level has happened quickly. As of this writing over 100 LEAs are connected to NCREN and have begun to discover

that when they go on net, state-hosted applications, tools, and services are delivered significantly more quickly and more reliably. Meanwhile, existing commercial Internet connections are freed up to allow more impact on teaching and learning. As of this report, over one hundred LEAs are already on net, connected to NCREN, and they have verified the value of the common-backbone concept.

MCNC's position as operator of the NCREN furthers MCNC's role as a neutral convener of the PreK-20 community. MCNC's community-based governance structure allows for rich, future-focused discussions regarding services and applications. This focus enhances North Carolina's reputation for conducting the kind of leading-edge research that drives North Carolina public education institutions toward excellence in teaching and learning.

The North Carolina Learning Object Repository

The North Carolina Learning Object Repository provides educators across the state with a centralized asset that allows them to catalog, search, assess, share, and use digitized learning/teaching content. Development of this PreK-20 resource has been a joint collaboration by staff from the North Carolina Community College System, the University of North Carolina system, the North Carolina Virtual Public School, and North Carolina Independent Colleges and Universities. Ownership and administration of NCLOR lies with the North Carolina Community College System, which provides funding and administration through its 2+2 Initiative.

The NCLOR has been described as a "Lib-oratory," which encompasses characteristics of both a library and laboratory. Like a library, the NCLOR allows the user to catalog, search, and access a large body of learning content quickly and efficiently. Like a laboratory, the NCLOR provides teachers, instructors, and professors with a means to conduct independent and group research and share results and reports.

The NCLOR is designed to integrate digital learning/teaching content, online learning platforms (content delivery mechanisms), enable federated ID management (the concept of single sign-on to access all resources students and faculty have permissions to access), and all learning applications provided by any and all stakeholder institutions and systems. Thus the NCLOR is the centerpiece of e-learning resources in North Carolina.

The NCLOR is designed to be scalable and standards based. Scalability is required for statewide, PreK-20 coverage. Standards ensure protocol, process, quality, and compatibility of resources.

All work related to NCLOR Request for Proposal (RFP) development, vendor evaluation and selection, planning and implementation is in keeping with e-Learning Commission recommendations. To that end, the NCLOR vendor contract establishes:

- Ability for buy-in by all educational entities in North Carolina, public and private, including educational/training departments of state agencies.
- Ability for buy-in by different purchasing authorities via memorandum of agreement with the NCCCS.

- Aggregate FTE/enrollment licensing formula by which price per FTE/enrollment unit drops as total license totals increase.
- Economies of scale realized by hosting by the North Carolina Information Technology Services and related savings in hardware, IT support, and administration.

Active use of NCLOR in live online courses began in fall 2008.

Ongoing e-Learning Projects

In the next few years, several promising collaborative projects will introduce leading-edge network-delivered services, applications, and tools into the PreK-20 education landscape. These technology tools, applications, and services will allow for cost sharing and efficient use of resources.

The North Carolina e-Learning Portal

A major collaborative initiative of the e-Learning Commission has been the creation of the North Carolina e-Learning Portal, designed as a central, customizable facility that provides the citizens of North Carolina with easy access to information about all e-learning opportunities in the state. When fully implemented, the portal will be a single point of entry for NC e-Learning, providing aggregation and personalization, and leveraging resources by establishing efficient and effective partnerships.

The development of a prototype of this portal was overseen by the Infrastructure Subcommittee of the North Carolina e-Learning Commission. Optimized Learning, Inc. and Unicon were contracted to provide:

- Installation, configuration, and branding of an uPortal application as a prototype for the PreK-20 North Carolina e-Learning Portal.
- Development of an initial portal vision, purpose, audience, content, image, visual details, and management plan.
- Three flat-file prototypes for consideration by the eLC.
- Incorporation of design elements and requirements based on feedback from surveys, focus groups, and direction from the eLC.
- Implementation and hosting of the preferred prototype as a pilot portal.

The development process began formally at the January 2008 eLC meeting, during which the commission reviewed and discussed expectations for the portal. The initial feedback from that meeting guided the development of a survey document to collect specific information on the vision, purpose, content, image, visual details, and management for the portal. Feedback was also sought from Business and Education Technology Alliance members, the NC Network, and the MCNC Collaborative Services Working Group.

In March 2008 the eLC began to conduct interviews with a series of focus groups in order to gather specific feedback about the portal from various North Carolina constituent groups. Where practical, these sessions used a collaboration tool called Elluminate. The

commission received invaluable input from the focus groups, allowing them to refine the portal design and functional requirements.

OLi delivered three flat-file prototypes at the eLC meeting on March 20, 2008, and asked the commission members to give feedback. Feedback was also received from members of the Business and Education Technology Alliance and the NC Network. Meanwhile, the eLC researched various state PreK-20 portals and Web sites. It hired a research assistant to coordinate continuing research using graduate students to collect information from other constituent groups such as the business community, working adults, and retirees.

Based on this feedback and research, in August 2008 the eLC asked OLi to subcontract with Cross + Associates to produce a new working prototype designed as a “proof of concept.” Cross + Associates developed a new navigation architecture, a new look and feel, and with the help of Unicon, redesigned the personalization function. To pilot the portal and test the portal's personalization feature, the developers limited the content of the proof-of-concept prototype to an audience of teachers and prospective teachers, dividing the content into three areas, PreK-12, college and university, and career. A “My Resources” link provided direct links to personalized content based on a user’s responses to the personalization survey.

In November 2008 the proof-of-concept prototype was distributed for testing and comment to a group of power users, including prospective e-learning students, PreK-12 counselors, and high-level educators involved in e-learning in North Carolina. The eLC is now reviewing their responses and will incorporate feedback during the production development phase.

Assuming the allocation of appropriate funding, the eLC expects to launch the production North Carolina e-Learning Portal in June 2009.

Database interoperability

Accountable educational decision making must be driven by accurate data. Such data allows education leaders to track student achievement and maintain links between students and teachers.

The prerequisite for seamless data transfer is the establishment of unique teacher and student IDs. In North Carolina, the PreK-12 education sector is currently consolidating student information systems and will be on a single system with unique and consistent IDs before the summer of 2009. PreK-12 is also kicking off a longitudinal data system to house all information centrally so that easily available for reporting at all levels in the state.

In summer 2009, PreK-20 will look to build on these milestones to enable the flow of the information between public schools, community colleges, and University of North Carolina, and, where feasible, North Carolina’s independent colleges and universities.

Collaborative procurement

The opportunities for savings to the state of North Carolina and specifically to public and private education entities in the state through collaborative procurement of technology applications, services, and hardware are significant.

An example is Web conferencing applications, which are widely used for e-learning delivery and for other purposes within state government. Organizations in the state of North Carolina currently spend approximately \$450,000 annually on licensing for a Web conferencing solution called Elluminate. This expenditure allows limited use at some of the UNC system schools, limited use for some North Carolina Office of Information Technology Services customers, limited use by some community colleges, and limited use at a few independent colleges and universities. NC State University and Duke University have unlimited licenses. Besides Elluminate, there are a number of licenses for other Web conferencing products, including Wimba, iLinc, Connect, Centra, WebEx, etc., which are being purchased at an unknown annual cost.

A centralized, statewide license for a single Web conferencing system would provide unlimited access to collaborative tools (including voice and video) for all entities in PreK-20 learning communities and state government. Such a state license would provide dramatic savings compared to the way Web conferencing tools are currently being licensed. Additional savings could be achieved by savings in travel costs (time, fuel, etc.). ITS and MCNC should further their growing body of collaborative work to jointly evaluate need and then procure services, applications, and tools used in both state administration and in public and private education. This strategy is certain to drive efficiencies and cost savings.

To achieve this benefit, amendments to the current Senate Bill 991 may be required. ITS and MCNC should be empowered to bring forth such recommended policy changes as part of the transition to the Perdue administration.

Cloud computing

The emerging arena of cloud computing allows for on-demand access to technological infrastructure. North Carolina's focus in cloud computing is the Virtual Computing Lab, housed at NC State University. VCL is a remote-access service that allows students to reserve a computer with a desired set of applications and access it remotely over the Internet. Students can use high-powered applications including Matlab, Maple, SAS, Solidworks, and many computing environments, including Linux, Solaris, and numerous Windows environments.

Development of VCL started in 2004 as a joint venture between the NC State College of Engineering and the NC State Office of Information Technology. The initial goal was to efficiently use hardware investments and to provide remote access to a wide range of advanced computer requirements by NC State University students, faculty, and researchers. With ongoing support from the College of Engineering, OIT, and academic and corporate partners, the VCL now successfully supports a wide range of users with diverse computing needs across the UNC and NC community college systems.

Open-source technology

Another example of innovation in learning technology has prompted the state's exploration of open-source-based learning management systems as a possible substitute for incumbent, proprietary systems. While the vast majority of PreK-20 e-learning providers in North Carolina currently use BlackBoard LMS products, we recognize that depending on a single vendor may limit competitive procurement opportunities, and that the product itself may limit innovative impulses by our faculty. In light of these concerns, the UNC system, several of North Carolina's private colleges and universities, and the North Carolina Community College System are actively piloting open-source alternatives or enhancements to BlackBoard learning management system products.

The widespread adoption of Linux, an open-source operating system, has proven the efficacy of open-source solutions. Two open-source learning management platforms, Moodle and Sakai, are rapidly gaining popularity among educational institutions worldwide, and are the focus of the current UNC and NCCCS pilot projects. These pilot projects include some use of open-source LMSs in the production environment under actual conditions. This is a prelude to potential pervasive use of open source LMSs in the next few years.

Federated identity management

Federated identity management provides a platform for cross-organizational use of computing services. Under FIM, if a high school and a community college are part of the same trust federation, a high school student can register for a course at a community college using her home high school credentials (such as user name, record number and access password). UNC GA and Internet2 are both providing federation services, and MCNC is collaborating across the NCREN community to evaluate how to build a statewide functional trust federation.

e-Learning Opportunities in North Carolina

Since 2006, when the E-Learning Commission began its work, all of the education sectors in North Carolina have increased virtual or e-learning programs. There has also been an increase in high school students taking college courses and community colleges and universities sharing degree programs. These collaborations, made possible by technology, are moving the education sectors toward a more seamless learning environment.

Programs for High School Students

All of the e-learning programs for high school students in North Carolina address the guiding mission established by the NC State Board of Education that "every public school student will graduate from high school, globally competitive for work and

postsecondary education and prepared for life in the 21st century,” along with these specific NCSBE goals:¹

- NC public schools will produce globally competitive students;
- NC public schools will be led by twenty-first century professionals;
- NC public students will be healthy and responsible;
- Leadership will guide innovation in NC public schools;
- NC public schools will be governed and supported by twenty-first century systems.

The e-learning programs support the work of DPI in addressing the need to update curriculum standards, assessments and accountability, as directed by the NCSBE. The e-Learning Commission will work with DPI to ensure that twenty-first century skills, pedagogy, and tools are integrated throughout the new standards, and that e-learning programs at the PreK-12 level will support educators in implementing the new standards and assessments successfully.

North Carolina Virtual Public School

Session Law 2007-323 provided funding at the Education Cabinet level to establish what is now called the NC Virtual Public School. In 2007 Lieutenant Governor (now Governor-Elect) Bev Perdue led the implementation of NCVPS, which is the first virtual public school established statewide in the United States.

North Carolina Virtual Public School provides expanded academic options to all NC high school students by offering online courses in subjects that may not be available at their local schools. NCVPS also offers online services such as test preparation, career planning services, and credit recovery.

There are many reasons parents and students consider instruction through NCVPS:

- A student may live in an area of the state where the local school system doesn't offer a specific course, such as Latin or AP Physics.
- A student can enroll in a NCVPS course to solve a scheduling problem if his class schedule doesn't allow attendance during the school day.
- A student may experience extraordinary circumstances, such as a physical or medical challenge that prevents him from attending school.

NCVPS was ranked in November 2008 as one of the top ten state-led virtual schools in the nation by Center for Digital Education. The report was produced with the advice and

¹ NC SBE and DPI. *Future-Ready Schools: Preparing Students for the 21st Century. 2004-2006 Biennial Report.*

consultation of the Council of Chief State School Officers and the North American Council for Online Learning

In the year and a half since NCVPS has been open, it has already provided over 39,000 virtual learning opportunities to students in North Carolina. While it began offering classes only at the high school level, NCVPS is running a middle school pilot program. When the middle school program is implemented, NCVPS will start a pilot program for elementary grades.

NCVPS expects to grow at a projected rate of 30 percent annually.

Year	NC Virtual Public School Enrollment
2006-07*	Summer enrollment: 8,131
2007-08	15,417
2008-09**	20,369

*NCVPS Opened June 2007

**Includes summer enrollments projections at 4000

All NCVPS teachers are highly qualified and certified to teach in the disciplines in which they are assigned.

Learn and Earn Online

Whereas NCVPS currently offers high school-level courses for high school credit, an initiative affiliated with NCVPS, Learn and Earn Online, allows high school students to take college-level courses online, earning high school and college credits simultaneously.

Learn and Earn Online grew out of the more traditional distance-education Learn and Earn program, in which high school students enroll in classes in local community colleges or universities while they are still in high school. Students completing a Learn and Earn course receive a dual-enrollment credit, earning college and high school credits at the same time. Some students have used Learn and Earn during a fifth year of high school so that when they graduate they receive both a high school diploma and an associate's degree. In essence, they receive two years of higher education for free.

Learn and Earn Online extends the benefits of Learn and Earn to the online environment, thus expanding access to students anywhere in the state. First offered in 2007, Learn and Earn Online is a partnership between the North Carolina Department of Public Instruction and the NC Community College and UNC systems. Although it is available to all high school students, participation for an individual school or school district is optional.

Learn and Earn is an excellent example of how North Carolina is shifting to a more seamless transition from high school to higher education. In fall 2008 Learn and Earn received the 2008 Innovations in American Government Award. This annual awards

competition, sponsored by the Ash Institute for Democratic Governance and Innovation at Harvard University's Kennedy School of Government, is designed to improve government practices by honoring effective initiatives and encouraging the dissemination of best practices.

UNC Greensboro's iSchool

The Division of Continual Learning at UNC Greensboro offers e-learning to high school juniors and seniors through its iSchool program. iSchool courses are college-level courses that are taught online by UNC Greensboro-approved faculty and delivered to networked computers at the students' base school. iSchool classes meet daily like traditional high school courses, iSchool classes meet daily, but students have the advantage of saving their work and returning to it after school and at home—as long as they meet their weekly deadlines.

Ninety-seven of North Carolina's 100 counties currently participate in UNCG iSchool. In its first year as part of Learn and Earn Online (2007-08), the iSchool had 2,648 enrollments spread across 139 high schools in sixty-three LEAs. In 2008-09, iSchool will have over 5,200 enrollments in 364 high schools in ninety-seven LEAs.

The UNC-G iSchool is the first virtual early college in the nation. The state of North Carolina funds iSchool enrollment through the Department of Public Instruction, and there is no cost for courses or textbooks. Students who successfully complete iSchool courses simultaneously satisfy high school graduation requirements and are awarded college credit.

North Carolina 1:1 Learning Technology Pilot Initiative and Plan

NCVPS, Learn and Earn Online, and the iSchool provide online delivery of twenty-first century curriculum and content, but they do not address the larger need of enriching the technological learning environment of our existing high school classrooms. The pilot NC 1:1 Learning Technology Initiative creates technology-intensive classrooms in which every student and teacher is given an individual laptop computer. NCLTI researchers then uses these classrooms as a research base to explore the best ways to integrate technology effectively to enhance teaching and learning. Research on the impact of technology in high schools in general, and on 1:1 computing programs in North Carolina and in other states in particular, shows that success in the NCLTI will require the following:

1. A well-articulated vision and rationale for the NCLTI approach, along with a strategic plan for implementing the approach;
2. Engagement and support from all constituents of the school community, including the LEAs, local government, the business community, and parents;
3. Collaborative school and district leadership teams comprising instructional, curriculum, technology, and administrative leaders who are committed to the NCLTI approach;
4. Professional development and ongoing support for teachers as they reshape and update teaching practices to take full advantage of the available technology, as

- well as for administrators as they update school management practices and support the teachers;
5. School-based staff, such as instructional technology facilitators and media specialists, who provide instructional support for the use of technology to enhance learning;
 6. A portable, wireless computer device for each student, teacher, and administrator;
 7. Additional technology to support teaching and learning in each classroom, such as a scanner, projector, digital white board, and digital camera;
 8. High bandwidth connectivity to the school and sufficient wireless connectivity throughout the school;
 9. Digital education resources for teachers and students, including tools and resources that support productivity (e.g., word processing), Web 2.0-based activities (e.g., blogs and wikis), e-learning (e.g., learning management and conferencing systems), curriculum planning, classroom management, student assessment, and teaching and learning in specific content areas;
 10. School-based technical staff who ensure that the technology is maintained, kept up-to-date and repaired as needed;
 11. Strategies for ensuring student safety and appropriate use of computers in accord with the Children’s Internet Protection Act and local policies, while still enabling teachers and students access to a wide range of information and communication resources;
 12. Sustainable funding to support the total cost of ownership of the technology resources and the costs of ongoing professional development.

The NCLTI was funded in part by Session Law 2007-323 §7.39, which provided \$3 million in non-recurring funds to establish pilot programs incorporating twenty-first century curriculum, personnel, professional development, and technology tools in public-school classrooms. This funding was linked to grants from the Golden LEAF Foundation and private-sector funds provided by SAS to establish the pilot NC 1:1 Learning Technology Initiative. The GLF grants provided funds for student portable computers; SAS provided funds for teacher portable computers; and state funds covered technology infrastructure, technical and instructional support, and program evaluation.

This funding has provided the pilot schools with technology resources and professional development that will support and extend other state initiatives moving toward future-ready schools, such as the new content standards and assessments being developed by DPI, the new teacher and administrator standards, the graduation-project requirement, comprehensive data systems, LEARN NC, the NC Virtual Public School, the Early College and Redesigned High Schools, and other state and local initiatives. Session law 2008-107 provides an additional \$1.5 million for expansion of the pilot program and for the development of a feasibility study and plan for a large-scale, statewide 1:1 Technology Learning Initiative informed by the technology pilots.

In addition to the NC 1:1 TLI pilot schools, there are currently a number of North Carolina schools implementing 1:1 learning technology initiatives, others planning to launch 1:1 initiatives, and many others seeking funding for 1:1 initiatives. Many other schools throughout the state are moving toward future 1:1 programs, often starting with mobile carts of computers to provide 1:1 computing in some classes each day. Schools

districts that have active 1:1 initiatives or planning to start one in the next year are listed in Appendix F.

Building on the processes used in planning the School Connectivity Initiative, the Friday Institute for Educational Innovation at NC State University is currently leading the development of a feasibility study and plan for a statewide 1:1 Learning Technology Initiative. The initial draft of the feasibility study is due in June 2009.

The North Carolina Community College System Online

For more than a decade, the North Carolina Community College System has invested heavily in e-learning, collaborating both across the community college system and with other sectors of the North Carolina education community. New NCCCS system president Dr. Scott Ralls has pledged to enhance this investment.

Hallmarks of the NCCCS e-learning environment are the system's 2+2 collaborative partnership with the UNC system; its participation in efforts to implement enhanced networked broadband connectivity, its adoption of an enterprise course-management system, its partnership in Virtual Computing Lab with NC State, and its collaborative Virtual Learning Community. In addition, NCCCS has been a leader in developing the North Carolina Learning Object Repository, a resource that assist educators at all levels by providing access to multimedia learning objects to assist in course development.

All fifty-eight North Carolina Community College System institutions offer online degrees and have recently experienced a tremendous increase in online-course enrollment. NCCCS schools experienced 50 percent growth from 2006-07 to 2007-08 and the system projects at least a 25 percent increase for 2009.

Year	North Carolina Community College System Online Course Enrollment	North Carolina Community College System Student Contact Hours*
2005-06	135,690	407,070
2006-07	164,074	492,222
2007-08	245,642	736,926
2008-09**	307,052	921,156

* Each course constitutes three student contact hours.

**Projected numbers based on a 25% growth, a conservative estimate.

While each NC community college maintains autonomy to remain responsive to local community needs, a culture of collaboration exists through which online courses and

resources are developed centrally and shared with all institutions. This collaboration and cooperation enhances and expands online resources and support, and drastically reduces development costs of online courses used across the system. As described below, the e-Learning Commission proposes to extend this type of collaboration across PreK-20.

The vehicle for collaborative course development is the NCCCS Virtual Learning Community. VLC was originally established in 1998 to develop the ten online courses most in demand at that time. The success of that early effort has morphed into the VLC of today, in which six VLC centers are in operation. Three of these centers concentrate on creating and improving online courses and resources. Each center has a special disciplinary focus:

1. STEM courses (science, technology, engineering, and mathematics)
2. Nursing, early childhood education, and developmental studies
3. Continuing education, vocational, and technical courses.

The other three VLC support centers interact and collaborate to provide support for quality assessment, staff development, and best use of technology. (Appendix G provides more information on NCCCS Online and the Virtual Learning Community.)

The University of North Carolina Online

In 2006 the North Carolina University system hired Erskine Bowles as its president. President Bowles brought to his role an enlightened leadership to continue the movement of the UNC system as a major competitor in the global economy. He initiated a statewide effort called UNC Tomorrow to find out from North Carolina's citizens what they needed from the university system. One of the findings of UNC Tomorrow was that the citizens of North Carolina wanted to have more ubiquitous access to courses offered by institutions in the UNC system.

President Bowles views online courses and degree program as one way to respond to the findings of UNC Tomorrow and also to respond to the growth in student population in the face of reduced funds for facilities. As noted in the chart below, UNC institutions have dramatically increased online participation by 435 percent in the last five years.

Year	UNC Online Unduplicated Online Student Head Count	UNC Online Student Credit Hours
2005-06	43,453	241,908
2006-07	52,797	304,556
2007-08	58,875	354,652

President Bowles charged the University of North Carolina system institutions to explore collaborative ways to extend the benefits of online instruction to a growing student population. On July 1, 2007, the University of North Carolina launched The University of North Carolina Online, a searchable Web site that aggregates all the degree, certificate, and licensure programs offered by the sixteen campuses of the UNC system. The goal of The University of North Carolina Online is to provide greater access to higher education for North Carolinians of any age. Special entry points are available for community college students, the military, and teachers. There are currently over 175 fully online degree, certificate, or licensure programs listed on the University of North Carolina Online site. Over 100 of these are full degree programs, and an additional fifteen are under development. Access to UNC Online is through this URL: <http://online.northcarolina.edu/>.

The infrastructure for the UNC Online was developed by Learn NC under contract and has received many very positive comments from users, developers, faculty, and administrators, within and without the system. It won the NC Distance Learning Association's Award for 21st Century Best Practice in Distance Learning for 2008, and GetEducated.com rates online courses offered through The University of North Carolina Online as a “best buy.”

The University of North Carolina Online shares a help desk with CFNC for students who may need further assistance. The system has a back-end customer-management system that collects data when information is requested from the campus or from UNC Online.

Thus, the technological infrastructure for The University of North Carolina Online is recognized as cutting edge and exceptionally well designed, with a flexible database that can accommodate future functionality.

In 2008 The University of North Carolina Online developed and implemented an inter-institutional online registration system that allows students registered in one UNC institution to more easily register at another UNC institution for an online course. This technology also allows the tracking of a student across campuses using only their local e-mail address and password, a major breakthrough. This same system is being evaluated by the iSchool for tracking high school students taking online college courses.

e-Learning Offered by NC Independent Colleges and Universities

Each of the thirty-six independent colleges and universities in North Carolina determines the amount of e-learning that is appropriate for its mission. While the primary focus of independent higher education is a residential experience that features small classes and face-to-face relationships with professors, a number of colleges and universities have seen value for students in adding online or blended courses to the curriculum.

The greatest number of online courses are offered by independent colleges and universities that offer adult completion programs or graduate degrees. Students in such programs often work full or part time, and they value the independence and flexibility that e-learning offers. These programs also draw students from around the world who

can “attend” class together and converse with each other to provide a global perspective without physically being in the same classroom or even on the same continent.

Establishing Standards and Assessing Quality

Digital Content Standards

Establishing common digital-content standards ensures standardized processes and quality for digital content that is shared across North Carolina's PreK-20 education system. As a common digital standard for all digital content, including content in the NC Learning Object Repository, all three public education systems in North Carolina North Carolina have adopted the SCORE standards established by the Southern Regional Education Board. The goals of SCORE are to improve the quality of digital learning, course content, learning objects, and tools; to improve teaching and learning; and to achieve costs savings.

SCORE recommends five key elements to achieve these goals:

- Integrated learning object repositories to allow faculty, teachers, and curriculum developers to easily develop, share, and use content across colleges, universities, and schools within and across states.
- Policies and procedures that will ensure quality by providing guidance and requirements to create, approve, store, and retrieve content.
- A consistent and mutually accepted meta-tagging convention and controlled vocabulary necessary for accurately and appropriately cataloging content.
- Policies regarding copyright and intellectual property owned by state education agencies, colleges, universities, and schools.
- Policies ensuring ADA compliance, security, privacy, identity management, and interoperability.

Evaluation of the NC Virtual Public School

After NC Virtual Public School was created by the North Carolina Legislature in 2005, one of its first acts was to contract for an evaluation of the sixty-two courses folded into NC Virtual from Learn NC and the Cumberland Web Academy. The initial evaluation was performed by an external group from Texas called Region 4. Using a rubric taken from the Southern Regional Education Board's extensive quality checklist for online courses, Region 4 determined that only three of the sixty-two courses offered met acceptable standards. The evaluation also provided NCVPS with invaluable feedback regarding the work that needed to be done in order to develop high-quality courses for the state of North Carolina.

In response to this feedback, NCVPS has taken the following actions:

- Since the initial evaluation, NCVPS has put all of its courses through three revision cycles: April 2008, July 2008, and November 2008. During each revision cycle, NCVPS uses the SREB and NACOL course-quality checklists to ensure

alignment to national standards. All of the NCVPS courses are now in compliance with these national standards, and none of them are completely text based (a major concern of the Region 4 evaluators). They all incorporate multimedia and Web 2.0 components as appropriate.

- All of the NCVPS AP courses have been submitted to the College Board's AP Audit, and all have been approved. Therefore, all of NCVPS's AP courses meet the high quality standards set by the College Board.
- NCVPS has adopted the High Five Process for instructional design, which ensures that each of its courses is aligned with the NC Standard Course of Study. The High Five process also aligns to National Staff Development Council standards, Marzano's effective instruction recommendations from the Midcontinent Research for Education and Learning, Tomlinson, Reeves, etc. in terms of research-based best practices.
- NCVPS has established a Research, Development, and Innovation team of NCVPS teachers who receive an additional stipend to do evaluative RDI work to ensure that NCVPS courses are high quality and on the cutting edge of technology.
- The Friday Institute conducted evaluations last spring to gather student and teacher feedback on their satisfaction with the courses. NCVPS used that feedback to inform its new strategic plan for 2008-09.

NCVPS will have another full external evaluation of its courses during the summer 2009 revision process.

Evaluation of UNC and NCCCS

All UNC and NCCCS campuses are well attuned to the role of standards for online learning. Campuses use the same processes for assessing online degree programs as for campus-based programs. Prior to offering courses or programs online, campuses must demonstrate that necessary resources for distance learning are available online or through other means. The regional accreditation agency, the Commission on Colleges of the Southern Association for Schools and Colleges, requires any degree program that offers more than 50 percent of its coursework online to demonstrate that the quality of the course, course instruction, library resources, and student support are comparable with campus-based programs. If these standards are not met, the delivery of the program online is not permitted.

Each program approved by the UNC Board of Governors for campus offering must be separately approved by the General Administration of UNC before it can be offered off campus or online. Systemwide standards for distance learning build on standards established by individual campuses and are similar to those of the Commission on Colleges and of the Southern Regional Education Board.

Because quality is a changing and moving target, quality assessment is an area of great innovation and change. UNC has formed an Online Quality Council whose task is to address issues of quality and standards. The members of this council are appointed by the

chief academic officer on each campus. The council serves as a focal point for quality issues or student complaints. Their task is to investigate the problem area, achieve a resolution, and then determine whether changes need to be made to keep the problem from occurring again.

Professional Development

An essential initial step to offering effective e-learning to North Carolina students is preparing teachers, faculty, and administrators to use technology to enhance teaching, learning, assessment, communications, and management. Although great deal of professional development in the use of technology is already available to North Carolina educators at every level, the state is just beginning to tap into the potential of online delivery methods. Virtual delivery has proven to be an effective, relevant, accessible, highly productive and cost-efficient method of delivering professional development instruction.

Advances in technology now allow instructors to create online learning materials and to design online learning environments that are not only comparable to traditional, face-to-face instruction, but in some instances superior to traditional instruction. Instructors team with instructional designers, computer programmers, graphic designers, and video/audio specialists to create highly effective interactive case studies, video mini-lectures, narrated PowerPoint presentations, simulations, group exercises, audio files, video clips, graphics, animations, educational games, interactive glossaries, embedded quizzes, graphical tutorials, Java applications, virtual tours, and expert guest lectures. Many of these same applications, learning objects, and templates can be used to develop effective online professional development.

Common Types of Online Professional Development

One e-learning format for OPD is individualized, self-paced online instruction, in which each participant proceeds through a series of online learning activities at his or her own pace. Often this approach involves some interaction with an instructor through an online discussion board, e-mail or, in some cases, telephone. While this approach provides the most flexibility, since each participant can work on his or her own schedule, it lacks opportunity for interactions with colleagues.

Another OPD format is online video. With this method, lectures, demonstration classes, and other materials are broadcast to multiple sites. Depending upon the available technology, participants can interact via video conferencing, audio conferencing, or online text messaging. In the past, this approach required that participants gather at a specific site in which video conferencing technology was available, but as the technology and available bandwidth continue to advance, video-based approaches are becoming more widely accessible to educators from their schools, offices, and homes.

In cohort-based OPD, a cohort of educators participate in a series of learning activities, exchanging ideas with others in the cohort as well as with the instructor. The cohort-based approach uses readily available Web-based technologies and asynchronous discussions, so educators can participate on their own schedules from any location with

Internet access. Some courses also integrate synchronous discussions, either text-based in a chat-room structure or voice-based, using online conferencing tools.

Other techniques are emerging. For example, professional development is now being presented in virtual environments such as Second Life, in which each participant is represented by an avatar who can move through the virtual space, exploring resources and interacting with others. Other professional development incorporates social networks to foster online professional learning communities that can provide ongoing professional development embedded within day-to-day practices. There are also hybrid models that integrate onsite meetings, classroom visits, or local study groups with an online course.

In addition to serving as a delivery method for full courses, e-learning can also be used to enhance and extend face-to-face workshops and courses, coaching and mentoring programs, teacher study groups, and other professional development approaches. In each case, the e-learning technology provides a convenient means of communicating and sharing information, one that doesn't depend on people being available at the same time or place. As an enhancement to other types of professional development programs, e-learning can enable participants to continue discussions from onsite meetings, provide access to experts and resources that are not available locally, enable rapid responses to questions, facilitate developing collections of shared resources, and, in general, deepen connections with colleagues and mentors.

OPD in North Carolina

Online professional development that is already available in North Carolina includes the Department of Public Instruction's Next Generation of Assessments and Accountability, which employs OPD to prepare teachers for the new writing assessment. DPI plans to offer OPD for the new essential standards and assessment across the content areas. The *Report from the SBE and UNC-GA Ad Hoc Committee on School Leadership* recommends that North Carolina “maximize use of online delivery of professional development for school leaders and create online professional learning communities for school leaders as on-going support mechanisms as appropriate” (p. 5).

Learn NC, community college, and university programs offer OPD modules to instruct teachers and faculty in the use of online tools (e.g., Moodle, Blackboard, eLuminate, wikis, and blogs) that can extend learning opportunities to their students. The Friday Institute offers OPD to teachers in 1:1 Learning Technology Initiative pilot schools. Topics include integrating Web 2.0 tools into the classroom, and continued support for math, science, social studies, and language arts teachers who attended face-to-face workshops. The North Carolina School for Science and Mathematics offers a series of videoconferencing courses for math and science teachers. In many cases, the demand for OPD exceeds what the organizations offering these programs can currently provide.

An excellent example and potential model for OPD is occurring in Davie County. Through the commitment of the Davie County Commissioners, the Parent Teacher Association and the Mebane Foundation sixteen teachers, called the Mebane Masters, are pursuing master's degrees in instructional technology from Appalachian State University. Instead of traveling from the county seat of Mocksville, North Carolina, to Boone (where Appalachian is located) three nights a week, the Mebane Masters leverage virtual worlds,

video-conferencing and audio-conferencing technologies to participate in their classes and activities virtually over NCREN. The Mebane Masters commit to staying in the classroom for at least three years after they complete their degrees, and Appalachian pairs sixteen student teachers with the Mebane Masters each semester. Davie County, in essence, is incubating the PreK-12 teacher of today and tomorrow using distance and virtual learning technologies.

The Growing Need for OPD

Driving the need for OPD in technology subject areas is the growth in e-learning opportunities across the state. Community colleges, colleges of education, and other university departments are rapidly increasing their online course offerings and, in some cases, are offering degree programs in which the majority of coursework is online. Instructing a class online requires that teachers receive professional development in how to use a course management system (e.g., Blackboard or Moodle), how to lead an online discussion, how to develop a podcast, how to set up learning opportunities in Second Life, how to design online examinations, how to design interactive case studies, and so on. If materials are created for use in online classes but instructors are not trained how to use those materials, the resulting experience for the students will be disastrous. In fact, having teachers and faculty first experience online learning as students provides a solid foundation so that they can consider using online techniques with their own students.

A few organizations and institutions within North Carolina have begun to create rich, interactive learning materials that introduce instructors to online teaching. For example, LearnNC, the NC Community College System's NC-NET, and East Carolina University all have developed modules or courses on aspects of online teaching, and other colleges and LEAs have created workshops for teachers interested in teaching online. There has not been, however, a coordinated effort in this area. As a result, there are practitioners developing many of the same activities and products, a lack of consistency and quality control, and limited ability to share resources across educators and organizations. Our goal should be to provide outstanding learning experiences for teachers, faculty, and students, but we want to avoid duplication of effort, save time and resources, and spread knowledge and innovations across institution. When it comes to professional development, we want to develop activities and mechanisms for sharing knowledge, practices, and learning objects.

2008 Recommendations of the NC e-Learning Commission

The North Carolina e-Learning Commission makes the following eight recommendations to the North Carolina Education Cabinet. These recommendations complement the fifteen recommendations made by the eLC in its 2006 report. (Appendix C: Matrix listing the fifteen recommendations of the 2005 eLC report and progress toward achieving them.)

Recommendation 1: The North Carolina Education Cabinet

Because the development of goals and standards for the North Carolina Virtual School requires a foundation of broad goals for PreK-20 education across the state, the North Carolina Education Cabinet, in collaboration with the Education Commission (commonly referred to as the Joint Boards), should develop goals and measures of accountability for PreK-20 education consistent with the governor's vision for education and economic development in North Carolina. To facilitate this and other work, a full-time staff for the Education Cabinet should be established and funded from existing resources. This staff should communicate and meet with the Education Cabinet members or their designated staff regularly to coordinate and study issues as specified in General Statute 116C-1.

Fiscal: \$300,000.00 (existing funds from School Connectivity designated for transfer to the Office of the Governor SECTION 7.28.(f) of SL 2007-323)

Rationale: With the election of a new governor of North Carolina, Bev Perdue, it is vital that North Carolina continue to lead the nation in preparing graduates for the demands of the global economy. The PreK-20 education sectors in North Carolina are largely structured for traditional education, with each of the sectors (public school, community college, and college or university) working independently of one other. Although cooperation and coordination among the sectors has been growing, as North Carolina continues to use the latest strategies for innovation, thereby improving graduation rates and college access, we must continue our work on a seamless PreK-20 system. The need for collaboration has become more evident as we implement high school reform efforts that combine high school and associate's degree programs (e.g., Learn and Earn).

The North Carolina Education Cabinet and Education Commission serve as the coordinated governance structure for PreK-20 education in North Carolina. The complementary work of the Education Cabinet and Education Commission encourages alignment of all programs delivered to NC learners.

The Education Cabinet comprises the leaders from each of the PreK-20 education sectors, including the Department of Health and Human Services. The function of the Education Cabinet is to resolve issues among existing providers of education and to develop a strategic direction for the continuum of education programs as specified in General Statutes 116C-3 by making recommendations to the Education Commission. The Education Commission, chaired by the governor, is composed of the governing boards from each of the education sectors. It provides a board-to-board discussion forum for the issues being addressed by the Education Cabinet.

In order to facilitate collaboration and achieve the vision set by the governor for North Carolina, as we branch into new technologies, the Education Cabinet and Education Commission must establish a common set of overarching goals and must establish measures of accountability for which all sectors are responsible. An outcome of the coordination effort will be elimination of duplication of effort in areas that cut across all sectors, leading to greater fiscal efficiency.

Recommendation 2: e-Learning Standards

The North Carolina Education Cabinet should ensure that standards are in place for e-learning across PreK-20 and should develop such standards if they do not already exist. These standards should guide the quality and rigor of e-learning courses, delivery mechanisms, access, and other structural needs across the state of North Carolina. The Education Cabinet should also review and advance policies that support infrastructure standardization and seamless transfer, especially in the areas of quality of course development, collecting student data, interpretation of the Children's Internet Protection Act, and delivering e-learning across PreK-20. To assist the Education Cabinet in developing these standards and policies, staff for the Education Cabinet identified in Recommendation 1 of this report should continue to implement the work of NCV as required in SL 2007-323 Section 7.28.(e). In addition, a research facility should be contracted to provide research and development services to assist in serving the needs of the Education Cabinet. An example of such a facility is the Friday Institute for Education Innovation, located at NC State University.

Fiscal: Same as Recommendation 1. \$300,000.00 (existing funds from School Connectivity designated for transfer to the Office of the Governor SECTION 7.28.(f) of SL 2007-323)

Rationale: Because of the progress made by the e-Learning Commission and the increased importance of e-learning across the state, the work of NCVirtual requires full-time attention and a sustainable structure. Although the e-Learning Commission has been a volunteer organization, the importance and volume of its workload has brought us to a point where we must institutionalize this valuable asset for PreK-20 education in North Carolina.

The Friday Institute for Education Innovation is a logical choice to conduct the necessary research on e-learning. The Friday Institute's mission is to advance education through innovation in teaching, learning, and leadership. The institute's scholars conduct research, create resources, advocate to improve teaching and learning, and provide services to educators and policymakers. Their work focuses on innovations that will help prepare all students, from preschool through college, to live and work successfully in the twenty-first century.

While research on e-learning is a natural fit for the Friday Institute, the Education Cabinet will draw on all relevant research that can assist with decision making. Embraced by all of NC's Education sectors, e-learning changes the landscape of traditional education and presents systemic challenges both in structure and policy. Such challenges include encouraging schools of education to incorporate online instruction as part of the curriculum for future teachers; ensuring that standards for content are

appropriate to the online environment; ensuring that accounting standards for funding are appropriate to online teaching (e.g., getting away from seat time and other measures that don't apply to the online environment); and establishing standard metrics for basic quality assurance and measurements, such as consistent measures for course completion.

Recommendation 3: NCREN

Virtual and e-learning require sufficient broadband connectivity through a robust network that provides secure and reliable service. The North Carolina Research and Education Network currently provides such service to the University of North Carolina system, many of the private universities and colleges, and some community colleges, and is in its second year of connecting all public schools to the network with a projected completion date of June 2009. The Education Cabinet should endorse NCREN as the statewide education network for education PreK-20. In addition, the community colleges, in collaboration with ITS and NCREN, should develop a plan no later than June 2009 to transition all community colleges in North Carolina to NCREN.

Fiscal: Existing resources

Rationale: Virtual or e-learning through a secure and reliable broadband network provides multiple opportunities for the successful education and development of workers. Robust collaboration creates the opportunity for real-time interaction so that students can learn from their counterparts anywhere in the world. Students can take courses with highly qualified teachers no matter where they live or work. Teachers can connect with colleagues to get or provide help or take courses without having to travel or wait for weeks to meet with someone to get assistance. This type of network affords all kinds of possibilities and addresses North Carolina's need to prepare students and workers for a global economy. It is an efficient and cost-effective way for PreK-20 students and educators to share services and reduce the cost of travel.

Recommendation 4: Center for Online Professional Development

The Education Cabinet should determine if an existing structure can be expanded to serve as a North Carolina Center for PreK-20 Online Professional Development, or create a new center if no appropriate structure exists. The center will work with existing developers and providers of OPD to sustain and extend their programs, provide coordination and dissemination of OPD programs, ensure quality control, and foster the effective use of OPD to help meet the professional development needs of educators throughout North Carolina. The center will develop incrementally over a three-year period. In the first phase, the center will establish quality-control standards and processes for OPD; will inventory, review, and catalog existing online professional development courses; and will act as a repository and information clearinghouse for high-quality online professional development courses and new technologies relevant to OPD. In the second phase, the center will conduct a needs assessment to identify high-priority needs for OPD; will add a core staff of course developers to convert existing face-to-face professional development courses to an online format in order to enhance access; will train course developers; and will organize teams to seek federal and other funding. In the third phase, the center will add to its previous activities by using the needs assessment to identify high-priority OPD courses that are not yet available; and will create, contract to

create, or motivate others to create new online courses or modules to fill those gaps. The process for creating the new online courses will be either through development teams based at the center or through an RFP process, depending on the volume of courses and determination of the most cost-effective approach.

Fiscal: Year 1: \$1.2 million
Year 2: \$2.7 million
Year 3: \$2.7 million

Rationale: North Carolina must prepare its teachers, faculty, and administrators to use technology to enhance teaching, learning, assessment, communications, and management. Such professional development can be delivered using online approaches, which have proven to be effective, relevant, accessible, and cost-efficient. The NC Center for PreK-20 Online Professional Development will ensure that North Carolina is making effective use of online means to provide widely accessible and relevant professional development, one of the four major goals set forward in the January 2008 Joint Technology Commission Report.

Recommendation 5: Technology Collaboration Council

The NC Virtual should establish a Technology Collaboration Council with representation from all PreK-20 e-learning providers and all e-learning technology-service providers (specifically MCNC and ITS). The role of this council will be to research and identify opportunities for collaborative infrastructure solutions and to recommend to the NCV the implementation of such solutions as appropriate. The council will include three sub-groups: networks/connectivity, servers/storage, and applications/services.

The research role of the proposed Technology Collaboration Council is already being substantially met by the MCNC Collaborative Services Working Group. Rather than duplicating this effort, the MCNC Collaborative Services Working Group should expand to include representation from all NCV stakeholders, and NCV should adopt this group as the research arm of the Technology Collaboration Council.

Fiscal: Can be established with existing resources.

Rationale: A collaborative approach to the provision and support of enabling infrastructure and services avoids duplication of effort, leading to a more efficient use of scarce resources and freeing e-learning providers to spend their energy on their core mission of educating students.

Recommendation 6: Learning Consumers Council

The NC Virtual should establish a Learning Consumers Council with representation from a broad geographic perspective and including students, parents, teachers, education advocacy groups, and the business community. The role of this council will be to provide input and feedback to the NCV and the Technology Collaboration Council to ensure that the needs of North Carolina's e-learning consumers are being met effectively.

Fiscal: Can be established with existing resources.

Rationale: The goal of the e-Learning Commission is to bring e-learning to every citizen of North Carolina. The Learning Consumers Council ensures accountability by eliciting input from a broad cross-section of e-learning consumers and providers.

Recommendation 7: NC e-Learning Portal

The General Assembly should provide one-time funding to launch the production version of the North Carolina e-Learning portal and recurring funding to sustain the production version of the North Carolina e-Learning Portal.

Fiscal: \$250,000 prototype to production – one-time
\$400,000 sustaining and updating – annual recurring

Rationale: Numerous studies and surveys show that an umbrella portal site helps speed adoption and increases the use of e-learning content for all sites linked through the portal. The development of a North Carolina e-Learning Portal, through which all e-learning resources offered by public and private education institutions in North Carolina can be searched, accessed, and saved in a personalized account, has been a major focus of the e-Learning Commission. A prototype portal, tentatively called e-Learning NC, was launched in November 2008. Currently, a number of major users—e-learning students, members of the North Carolina Distance Learning Association, and members of the MCNC Collaborative Services Working Group—are testing the portal. In addition, the portal will be demonstrated to Friday Institute staff, teachers, and education administrators. Their feedback will be collected and logged, and will serve as the basis for the design of the production version of the portal.

Moving the portal from prototype to production will require a one-time investment. This investment will include incorporating the feedback from the testing of the prototype into the production site, and extending the personalization function to a broader range of users. In addition, the portal will require recurring funding for continued improvement, hosting, maintenance, administration, and access to subject-matter expertise.

Recommendation 8: Data Mining and Dynamic Reporting System

To provide a foundation for the dynamic and personalized environment that ubiquitous access to e-learning content requires, the Education Cabinet should develop an aggregated PreK-20 statewide intelligent data-mining and dynamic reporting system that will allow real-time access to information in a format that can be used to assist with decisions on personal learning plans for students, professional development plans for instructors, and resource-allocation decisions for institutions, districts, and entire systems.

Diligent work on several facets of an integrated data-mining and reporting system for PreK-20 education in North Carolina is already under way. For example, work on assigning a unique identification number for each student in North Carolina public education, long a difficult goal, is now in an advanced stage.

As a next step in moving North Carolina toward one common dataset or a system that links the data for public education, the Education Cabinet should assemble a group of

leading information technology officials from the cross-section of public education and task them with reviewing the existing body of work and with producing a specific plan to develop the remaining elements of a comprehensive data-mining and dynamic-reporting system. The group should pay special attention to the work being done by NCDPI through the federally and state-funded CEDARS program for K-12 and the K-20 data system initiative with UNC and NCCCS to determine how these initiatives support this effort. The plan should be completed by June 2010 with implementation slated to occur over the period 2010–2013. The existing group of professionals meeting to discuss a common data system across PreK-20 should be viewed as the most likely group with which to begin this task.

Fiscal: Will be a part of the proposed integrated plan due June 2010.

Rationale: Each sector of public education in North Carolina (early childhood, PreK-12, community colleges, and the UNC system), collects mountains of data related to student biography, student achievement, instructor professional development, instructor competency, instructor satisfaction, institutional success, and many other subjects. But even within the specific sectors of education, we have limited ability to aggregate data from various data repositories and employ data dynamically to make student, classroom, school, district, or systemwide decisions.

Aggregating or building a system linking these comprehensive but siloed datasets into a dynamic system of delivery will give us the information we need to make good decisions and midcourse corrections when appropriate. The network infrastructure is already in place in most cases to develop and properly implement such a system. It is now time to move toward this more comprehensive approach.

Aggregated data will provide accountability across the range of public education, allowing us to identify, develop, reward, and retain excellent instructors, especially for the students who need them most. We need to amass data-driven evidence, and we need to go where it takes us.

Finally, after we have the capacity for data-based decision making, we must support it by a comprehensive system of professional development to train instructors, administrators, parents, and students in how to interpret, manipulate, track, and use data for direction and decision making.

Projected e-Learning Commission Budget for FY08-09

**Projected E Learning Commission Budget for FY08-09
(7/1/08 to 6/30/09)**

	Total Category Monthly	Total
Office Rental	\$1,575.00	\$18,900.00
Admin Support	\$2,000.00	\$24,000.00
Research Support	\$5,800.00	\$69,600.00
PORTAL		
Portal Pilot and Operation	\$14,617.67	\$175,412.04
Project Manager	\$2,000.00	\$ 24,000.00
Self enrollment feature (1 time cost)		\$ 30,000.00
Content Information (1 time cost)		\$ 38,000.00
Meetings and travel	\$1,000.00	\$12,000.00
Total		\$ 391,912.04

List of Appendices

Appendix A: Members of the e-Learning Commission

Appendix B: Coordinated Reporting for Organizations Supporting e-Learning in North Carolina

Appendix C: Matrix Listing the Fifteen Recommendations of the 2005 eLC Report and Progress toward Achieving Them

Appendix D: 2008 Reports of the eLC Subcommittees

Appendix E: Links to North Carolina e-Learning Resources

Appendix F: NCLTI Participating LEAs

Appendix G: NCCCS Online and the Virtual Learning Community

Appendix A: E-Learning Commission Members 2007-08

Chairman of the eLC

Bev Perdue, Lieutenant Governor
(now Governor-Elect)
State of North Carolina

Vice Chairman of the eLC

Tony Copeland
President/CEO, Longistics, Inc

Members of the Commission

Peter Asmar
Chief Information Officer/
Associate State Superintendent
NC Department of Public Instruction

George Bakolia
Chief Information Officer
State of North Carolina

Wanda Barker
Distance Learning Instructional Designer
NC Community College System

Robert Brown
Dean, Division of Continual Learning
UNC-Greensboro

JB Buxton
Deputy State Superintendent
NC Department of Public Instruction

Lee Dedmon
Principal, Highland School of Technology
Gastonia, NC

Phil Emer
Friday Institute for Educational Innovation

Cindy Fertenbaugh
Electronic Data Systems
Cabarrus County Board of Education

Joe Freddoso
President and CEO
MCNC Wendell Hall
Hertford County Board of Education

Darlene Haught
Dean, Distance Learning Technologies
NC School of Science and Mathematics

Terry Holliday, Ph. D.
Superintendent, Iredell-Statesville Schools

Glenn Kleiman
Director
Friday Institute for Educational Innovation

Rhonda Moore
High School Counselor
Lumberton, NC

Alan Mabe
Vice President for Academic Planning
and University-School Programs
General Administration
University of North Carolina

Tom Miller
Professor and Vice Provost
DELTA (Distance Education and
Learning Technology Applications)
North Carolina State University

Edgar Murphy
Nortel Networks

Jane Pendry
College Liaison
Early Middle College Programs
Guilford Technical Community College

Jane Patterson
Director, e-NC Authority
NC Rural Economic Development Center, Inc.

Martel Perry
Executive Vice President, Shaw University

Bill Randall
Associate Vice President
Learning Technology Systems
NC Community College System

Clayton Sessoms
Director, Division of Continuing Studies
East Carolina University

Sandra Williams
Vice President, Division of Administration
North Carolina Community College System

Bryan Setser
Director, NCVirtual Public School

Cathy Tomon
Principal, Broad Creek Middle School
Newport, NC

Staff to the eLC

Myra Best
Director, BETA/e-Learning Commission