Revised Joint Report on Information Technology presented to the 2008 Session of the General Assembly
January, 2008

Submitted by:

Business Education Technology Alliance, GS115C-102.15

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Executive Summary and Recommendations:

Today's students need to be critical thinkers, problem solvers and effective communicators who are proficient in new, 21st century content areas such as global awareness and financial and civic literacy. Access to core curriculum and supplemental content that is enabled by information and communications technology is essential in helping students develop the requisite skills for the work force, effective citizenship and higher education. Using technology to enhance learning equips students with the skills to take advantage of and thrive in the technology-intensive future of the 21st century.

A superior network with reliability, security, scalability and massive bandwidth is critical to the success of both business and education. The network provides a platform that "connects" multiple populations and enriches their experiences by providing a mechanism for communicating with each other, enhances opportunities for problem solving, creativity and teambuilding. More importantly, it provides access to digital resources that enhance and the importance of preparing both current and future teachers to use technology to enhance learning. It also provides access to information, learning options and eliminates the "zip code" limitations experienced by many students today and replaces it with a "planet code" that connects Rocky Mount with Russia as easily as it does with Roanoke Rapids.

The following recommendations are made jointly by the Business Education Technology Alliance, the School Technology Commission and the Joint Legislative Oversight Committee for Information Technology. They are based on the Four (4) essential elements necessary for *Future Ready Schools in North Carolina* as discussed in the attached report to fully infuse technology into the Public Schools of North Carolina. They are revised from the 2007 Joint Report to reflect changes made by the 2007 session of the General Assembly and for continued implementation.

Recommendations:

Workforce Preparedness

1. The General Assembly should continue to invest in new and existing innovative education projects and public-private partnership projects that support and are aligned with the State Board of Education's (SBE) *Future-Ready Students* priority and goals. These initiatives include but are not limited to the Center for 21st Century Skills, New Schools Project, Literacy Coaches, NC Virtual Public School (NCVPS), Learn and Earn, Learn and Earn On line, Early Middle College Schools, the IMPACT Model, NC Technology Association (NCTA) Demonstration Projects, the 1:1 lap top initiatives and the Graduation Project.

These projects serve as models for changing and/or transforming the teaching and learning in "future ready" schools using 21st Century skills so that students are prepared to compete in a global economy. They also serve as research and development sites so that other schools can benefit from the lessons learned during the implementation phase of the projects. For other schools to benefit, evaluation and documentation of lessons learned is essential.

2. NC Department of Public Instruction (NCDPI) should continue to align its work with the State Board of Education's (SBE) *Future-Ready Students* priority and goals so all public school students will graduate from high school globally competitive for work and postsecondary education and prepared for life in the 21st Century. NCDPI should make recommendations to the SBE and the General Assembly for changes to any laws, rules or regulations that prohibit the SBE from carrying out its priorities and goals no later than January 15, 2009.

3. The NC Department of Public Instruction (NCDPI) should align the NC State Technology Plan with the State Board of Education's (SBE*) Future-Ready Students* priority goals so that all public school students will graduate from high school, globally competitive for work and postsecondary education and prepared for life in the 21st Century. It should also align with the School Connectivity Initiative and the other 3 essential elements of this report.

   The NC State Technology Plan provides a framework for Local Education Agencies (LEA) as they plan for technology integration into their schools that supports the school's instructional program. The Local Education Agency (LEA) technology plans are monitored by the NCDPI for instructional technology and by NC State Information Technology Services for technical infrastructure to ensure minimum standards are met. The alignment with the SBE's priority and goals should be complete and the School Connectivity Initiative so that LEAs can begin making the necessary changes to their plans no later than March 1, 2008.

Educational Technology Readiness

4. The 2008 General Assembly should provide the additional $12,000,000-R to fully fund the school connectivity initiative @ $24,000,000 for which it received $12m R in the 2007 session of the General Assembly. This will connect all of North Carolina's public schools to a single statewide education network. The goal is to connect approximately 1500 schools by June 30, 2008 and all school to the statewide network by 2009-2010.

5. The State Board of Education should study and evaluate the School Connectivity Initiative using an outside evaluator over the next three to five

years in order to determine the effects of the use of technology and its impact on 21st Century Teaching and Learning. This should be a comprehensive study and incorporate all 4 Essential Elements as outlined in this report. Funds allocated for the School Connectivity Initiative should be used to fund the study.

6. The General Assembly should provide $20 million to establish a Future Ready Schools fund to provide technology tools and support for classrooms. Middle schools (36) who are identified under the Comprehensive Support Model framework should be the first priority in year one (1). The State Board of Education should establish criteria for how the schools will receive these funds including but not limited to, connectivity and infrastructure readiness as identified by the School Connectivity Initiative, how it will be used to facilitate instructional goals for student learning including use of Learn and Earn on line, the NC Virtual Public Schools and other digital content.

   The base-line cost to equip these classrooms with digital white board technology, data projectors, computers or other computing devices, plus a technology facilitator and other technical personnel for each school is $7,233 per classroom based on 2006-07 estimated cost.

7. The State Board of Education should develop a recognition program for all schools who are Future Ready based on the Four (4) Essential Elements in this report. The Future Ready Schools Fund and School Technology Fund should be used to assist schools in meeting this expectation.

8. The E-Learning Commission should present a plan to the Education Cabinet for establishing the NCVirtual (NCV) with the Education Cabinet located in the Office of the Governor. The plan should include expanding the statewide network to support all Community Colleges, public and private Universities and Colleges and to support seamless learning for all students. This plan with budget should be developed no later than April 15, 2008 for consideration by the Joint Legislative Technology Commissions.

Policy Framework

9. The Education Cabinet should adopt new priorities and goals for a global economy consistent with those established by the State Board of Education (SBE). These priorities and goals will provide the policy framework so that all education entities are working toward a seamless transition for advanced education for all of North Carolina's citizens. The priorities and goals should be in place no later than June 30, 2009.

10. The Business Education Technology Alliance and the School Technology Commission should work in collaboration to ensure comprehensive implementation of the 4 Essential Elements for *Future Ready Schools in*

North Carolina outlined in this Joint Technology Commissions Report, January 2007. The purpose is for each commission to incorporate any changes needed to any laws, rules or regulations in their recommendations to the SBE and the General Assembly that they are required to report annually.

11. The School Technology Commission should review the legislation that guides its work and its charge and make recommendations for any changes needed for any law, rule or policy no later January 15, 2008.

12. The Business Education Technology Alliance should incorporate into its work to assist the mission of the e-NC Authority as it works to expand affordable broadband connectivity to all households, businesses and communities in the state. This work should be in concert with the existing key relationships e-NC has established with commercial providers.

    The expansion of broadband connectivity to the entire state will further enhance the efforts of the SBE's work to prepare students for a global economy by providing the infrastructure and connectivity necessary to infuse technology into education. The infrastructure and connectivity will provide access for all citizens to the learning content and administrative resources being developed by the Public Schools, the public and private Universities and Colleges, the Community Colleges.

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- School Technology Commission
- Joint Legislative Oversight Committee for Information Technology
- State Board of Education
- Governor's Education Office
- Lt. Governor's Office
- NC Department of Public Instruction (NCDPI)
- North Carolina Technology Association (NCTA)
- NC Business Committee for Education (NCBCE)
- NC Association of Educators (NCAE)
- NC Citizens for Business and Industry (NCCBI)
- NC School Boards Association (NCSBA)
- NC Education Technology Corporation (Technology Directors) (NCeTC)
- NC Association of School Administrators (NCASA)

Preface:

This is the 2008 revised joint report of the Business Education Technology Alliance (BETA), the School Technology Commission and the Joint Legislative Oversight Committee for Information Technology to the North Carolina General Assembly. These commissions are charged to develop recommendations for technology in North Carolina's Public Schools. Due to the shared interests of the commissions as charged by the General Assembly, the chairmen of the commissions initiated this joint report to ensure a comprehensive and focused effort to infuse technology in all North Carolina's Public Schools so that public school students are Future Ready for the global economy.

Purpose of the Joint Report:

Comply with GS115C-102.15 for the Business Education Technology Alliance to report annually to the Joint Education Oversight Committee of the NC General Assembly, and the State Board of Education on changes needed to any law, rule or policy that would improve education technology in the public schools.

Comply with the GS115C-102 requirements for the School Technology Commission with regard to the NC Education Technology Plan and other pertinent requirements as noted in the general statute.

Desired Outcomes for the Joint Report:

- One Comprehensive Report for the use of information technology that builds on North Carolina's strengths and current State investments that is supported by BETA, School Technology Commission and the Joint Legislative Oversight Committee on Information Technology.

- Recommendations for more effective and efficient use of state funding for technology in schools with strong accountability.

- Recommendations for using technology that creates capacity for providing high quality education to all students, shares resources, and creates learning options for all students across PreK-12, Community Colleges, Universities and Colleges.

The 4 Essential Elements for Future-Ready Schools in North Carolina

Rationale

Not since the aftermath of Sputnik when the American education system was criticized because the then Soviet Union beat the United States into space has the American education community given such close scrutiny to student achievement. Even after a decade of tougher standards, tests, and for the latter few years, *No Child Left Behind*, American students are still not ready to meet the challenges of the 21st Century. In order to be college and work ready students must not only master core subjects that have been infused with 21st Century skills and technology, they must also be able to use critical thinking skills to solve real problems, compete with creativity and innovation in a world where knowledge will double at a pace hard to imagine, and communicate effectively in written and oral forms.

Whether one accepts all the premises regarding globalization outlined in Friedman's book, *The World is Flat*, the data support the notion that American students are not choosing science and math careers in numbers large enough to satisfy public and private sector needs. Nor are students prepared with the formal technological, collaborative, and media literacy skills required by today's sophisticated workplace.

In order for North Carolina's students to achieve success in 21st Century Skills and meet the needs outlined by the State's major employers as documented by the North Carolina Business Committee for Education (NCBCE) survey (See Attachment 1), North Carolina public schools must be up-fitted according to four essential elements. Those elements are as follows:

1. Delivery of 21st Century Curriculum, Instruction, Assessments and Accountability (Content)
2. Presence of Technology Tools in the Classrooms (Infrastructure)
3. Existence of widely accessible and relevant Personnel and Professional Development (Infrastructure)
4. Pervasive existence of high bandwidth connectivity and scalable networks (Infrastructure)

State Board of Education Mission, Goals and Priorities

Cognizant of the need for schools to change to meet the growing demands of the 21st Century economy, in September 2006 the NC State Board of Education adopted goals and priorities designed to increase the rigor and relevance in the public schools. The priorities emphasize the need for globally competitive academic programs, technologically savvy and

globally aware students and teachers, and appropriate infrastructures and systems. The visionary strategic plan won the "Practice of the Year" Award from the National Partnership for 21st Century Skills.

The mission, goals, and priorities of the Board serve as the driver and organizational tool for the state's local education agencies. The priorities also serve as the template for each local school's School Improvement Plan, the fluid document that outlines strategies for improving student achievement. The mission and goals are as follows:

FUTURE-READY STUDENTS

The guiding mission of the North Carolina State Board of Education is 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.

Goal: NC public schools will produce globally competitive students.

- Every student excels in rigorous and relevant core curriculum that reflects what students need to know and demonstrate in a global 21st Century environment, including a mastery of languages, an appreciation of the arts, and competencies in the use of technology.
- Every student's achievement is measured with an assessment system that informs instruction and evaluates knowledge, skills, performance, and dispositions needed in the 21st Century.
- Every student will be enrolled in a course of study designed to prepare them to stay ahead of international competition.
- Every student uses technology to access and demonstrate new knowledge and skills that will be needed as a life-long learner to be competitive in a constantly changing international environment.
- Every student has the opportunity to graduate from high school with an Associates Degree or college transfer credit.

Goal: NC public schools will be led by 21st Century professionals.

- Every teacher will have the skills to deliver 21st Century content in a 21st Century context with 21st Century tools and technology that guarantees student learning.
- Every teacher and administrator will use a 21st Century assessment system to inform instruction and measure 21st Century knowledge, skills, performance, and dispositions.
- Every education professional will receive preparation in the interconnectedness of the world with knowledge and skills, including language study.
- Every education professional will have 21st Century preparation and access to ongoing high quality professional development aligned with State Board of Education priorities.

- Every educational professional uses data to inform decisions.

Goal: NC public school students will be healthy and responsible.

- Every learning environment will be inviting, respectful, supportive, inclusive, and flexible for student success.
- Every school provides an environment in which each child has positive, nurturing relationships with caring adults.
- Every school promotes a healthy, active lifestyle where students are encouraged to make responsible choices.
- Every school focuses on developing strong student character, personal responsibility, and community/world involvement.
- Every school reflects a culture of learning that empowers and prepares students to be life-long learners.

Goal: Leadership will guide innovation in NC public schools.

- School professionals will collaborate with national and international partners to discover innovative transformational strategies that will facilitate change, remove barriers for 21st Century learning, and understand global connections.
- School leaders will create a culture that embraces change and promotes dynamic continuous improvement.
- Educational professionals will make decisions in collaboration with parents, students, businesses, education institutions, and faith-based and other community and civic organizations to impact student success.
- The public school professionals will collaborate with community colleges and public and private universities and colleges to provide enhanced educational opportunities for students.

Goal: NC public schools will be governed and supported by 21st Century systems.

- Processes are in place for financial planning and budgeting that focus on resource attainment and alignment with priorities to maximize student achievement.
- Twenty-first century technology and learning tools are available and are supported by school facilities that have the capacity for 21st Century learning.
- Information and fiscal accountability systems are capable of collecting relevant data and reporting strategic and operational results.
- Procedures are in place to support and sanction schools that are not meeting state standards for student achievement.

Essential Element 1: **21st Century Curriculum, Instruction, Assessments and Accountability**

Business leaders report that while the three "R's" are still fundamental to every employee's ability to do the job, applied skills such as teamwork, critical thinking, and communication are essential for success at work. In fact, at all educational levels, these applied skills trump basic knowledge skills such as reading and mathematics in importance in the view of employers. In order to succeed in the workplace of the 21st Century, high school and college graduates need to master basic academic skills as well as a complement of applied skills. The survey also found though that too many new entrants to the workforce are not adequately prepared in these important skills. (Are They Really Ready to Work? Report of the Conference Board, the Partnership for 21st Century Skills, Corporate Voices for Working Families, and the Society for Human Resource Management - 2006).

New Initiatives and Programs

In order to improve student achievement and ensure that North Carolina students are better prepared for college and the workplace, the State Board of Education is involved in a variety of innovative projects. The projects are a result of partnerships with the Office of the Governor, the Office of the Lieutenant Governor, the Bill and Melinda Gates Foundation, the constituent campuses of the University of North Carolina, The North Carolina Community College System, and ACHIEVE to name a few. All of these innovative projects or initiatives are integral to the State Board of Education's comprehensive reform effort to transform all public schools so that all students are *Future Ready*. Some are described below:

New Schools Project

Backed by $25 million in grants from the Bill and Melinda Gates Foundation and additional appropriations from the NC General Assembly, the North Carolina New Schools Project (NCNSP) provides leadership and planning grants to school systems to create small school environments that focus on personalization and rigor for every student. All 44 schools in the NCNSP use technology as a core tool for students to complete their work. Some of the new schools, for example New Technology, use technology tools as the organizing factor. In New Technology Schools students have one-to-one computers; access their information from the Internet; complete, present, and submit all assignments using technology; and receive all teacher feedback in digital format. All student information is stored in a digital warehouse.

In November 2007 a new Bill and Melinda Gates Foundation partnership was finalized between the UNC System and the New Schools Project that will establish four "Learning Laboratories" for high school innovation. Currently North Carolina teachers and principals have to travel to other states in order to see firsthand what it takes to graduate all students ready for college, careers, and life. Through these learning laboratory High Schools, the evolution of four traditional high schools will be accelerated by connecting the resources of the university system to the high schools. Access to university faculty and content to enrich the learning experience; access to facilities are just two of the planned enhancements. Two

of the learning labs will be redesigned high schools and two will be Learn and Earn high schools.

Learn and Earn High Schools

In 2004 Governor Easley developed a new high school initiative that offers high school students an opportunity to graduate after five years with an Associate's Degree or with two years of college transfer credit. The Community College System partners with the public schools in providing *Learn and Earn Early College Schools* that help drive the expectation of student matriculation to post secondary education, which is essential in the global economy and easing the transition from high school to higher education. During the 2007 General Assembly at the Governor's request, the General Assembly appropriated funding for EARN Scholarships that will provide the final two years of the baccalaureate degree debt-free for qualifying students. With the promise of a 21st Century college education students will be encouraged to remain in school and develop skills and knowledge needed in the globally competitive workplace. Currently there are 42 Early College High Schools with plans for 24 more in the 2008-2009 academic years.

Learn and Earn Online (LEO)

The 2007 General Assembly appropriated funding that allows high school students to enroll in college courses to qualify for college credit. Online courses will be made available to students through the University of North Carolina and the North Carolina Community College System. State public school funds may be used for course tuition, textbooks, and technology needs associated with the college courses. The Learn and Earn Online initiative will allow all students across the state access to college courses, even in locations where a student does not live in proximity to a university or community college. This 21st Century use of technology to deliver rigorous content will equalize opportunities for all North Carolina students regardless of where they live.

Access to the college courses is provided during the regular school day and an online course facilitator assists students in the classroom. Two hundred and sixty two (262) courses are being offered through UNC-Greensboro online (UNC-Gi) and the community colleges. Students can enroll in UNCGi courses or community college courses regardless of geographic location. Approximately 277 high schools are participating in the fall of 2007 with 2,030 enrollments by mid semester. Five quality points may be awarded upon completion of selected courses in the 100-200 range and 6 quality points for 300 and 400 level courses.

Demand for these on-line courses is expected to rapidly accelerate in 2008 and 2009. The success of learn and earn on-line is inexorably linked to the successful implementation of a K20 network backbone for education in North Carolina.

School Technology Pilot

The 2007 General Assembly, in partnership with the Golden Leaf Foundation, funded a one-to-one computer initiative with one traditional and eight Learn and Earn Early College high schools across the state. In addition to providing portable computers to teachers and students, funds may be used to purchase software, hardware, and other equipment

necessary to support the program as well as provide two positions at each school to offer instruction and on-site technical assistance. Included in the project is an evaluation component to be completed by the Friday Institute at NC State University. The evaluation will focus on the effect continuous computer/technology availability has on student achievement, provide a cost-benefit analysis, make recommendations for improvements in the program, and make recommendations regarding the possible continuance or expansion of the program.

NC Virtual Public School

In 2006, Lt. Governor Bev Perdue led the effort to fund and develop the first state virtual public school. This effort was based on the fact that the 21st century is known as the information age, the knowledge economy, the digital revolution and endless opportunities. A student's career success in life will be a function of what curricula, what teachers and what learning options the student has access to and the extent to which the student has acquired lifelong skills for learning.

The ubiquity of the Internet, technology, and information provides access to knowledge and teaching and learning resources anywhere, anytime, anyplace, and any pace. Technology literacy skills are a pre-requisite for career success in the 21st century. More over the world in which schools are preparing students is imbedded with technology.

Beginning in the summer of 2007 the North Carolina Virtual Public School (NCVPS) became operational with 6,990 enrollments in twenty five (25) accelerated and credit recovery courses. The NCVPS provides an opportunity for students to access additional on-line courses and teachers that otherwise would not be available. Based on the student's interest and academic needs a customized learning profile and environment can now be created and be available twenty four hours a day to accommodate the student's schedule differences and help the student realize his or her learning potential. In the fall of 2007, NCVPS offered 67 courses for a total of 5,794 enrollments by mid semester. The NCVPS continues to develop courses that met high quality standards for on-line learning to equitably meet the growing diverse needs of students from across the state.

Demand for NCVPS courses is expected to rapidly accelerate in 2008 and 2009. The success of learn and earn on-line is inexorably linked to the successful implementation of a K20 network backbone for education in North Carolina.

American Diploma Project

In the spring of 2006 North Carolina's three governing boards committed to participate in the American Diploma Project (ADP), an initiative designed to add rigor to the curriculum and ensure that high school diplomas indicate that graduates have the skills and knowledge to be successful at the next level. The ADP partnering agencies along with business and education representatives have developed standards in English and Mathematics that are necessary for college and work. Initial feedback on the North Carolina Standard Course of Study indicate that NC math standards are "bellwether" and worthy of replication. The review noted that the English Language Arts standards are weak in the

area of work-ready skills, particularly information communication. North Carolina students need additional work in being able to draw meaning and manipulate digital information. Again, technology is the core for improved student achievement.

As the mathematics curriculum is revised during the 2007-2008 school year, attention is being paid to 21st Century skills and rigor. The curriculum is being reviewed for a second time by the American Diploma Project and is also being reviewed by the Century for 21st Century Skills in order to ensure that it will meet the needs of students preparing for global competition. When the English Language Arts curriculum cycles through the revision process, similar reviews will be applied to ensure its rigor and relevance in a 21st Century world.

Literacy Coaches

In the fall of 2006 one hundred (100) literacy coaches were allocated to middle schools to improve student reading skills in English Language Arts and across all content areas. The 2007 General Assembly increased the total number to 200. The secondary purpose of these coaches is to train and coach teachers. The NC Teacher Academy received funding to design and train the literacy coaches in Information, Communication, and Media Literacy. Skills include, among others, analyzing and manipulating data from all media, using technology to make observations and predict results, and creating charts and graphs to demonstrate information.

The Middle School Literacy Coach serves as a member of the school faculty who works with the elected School Improvement Team to develop a Literacy Improvement Action Plan. The responsibilities of the literacy coach include literacy assessment, conducting professional development in literacy teaching strategies, modeling effective classroom instruction, and observing and providing feedback to teachers. The coach has proven excellence as a classroom teacher and exemplary skills in developing, implementing, and assessing the impact of instructional strategies to improve academic literacy, overall achievement in core content areas, problem-solving skills, and use of current technology. A broad knowledge of Middle School content in all core instructional areas is necessary. Coaches use the instructional research and strategies that they learn with teacher colleagues in their schools, and must coach them in their successful implementation of the strategies in their classrooms. (See Attachment 2 for Literacy Coach Standards)

Graduation Project

Graduating seniors in 2010 will have to satisfy a new multi-disciplinary requirement, the Graduation Project, in order to receive a North Carolina high school diploma. A majority of high schools in the state have been participating in a similar initiative for the past decade. Feedback from those schools has indicated that the project leads students to synthesize the knowledge and skills gained through discriminate course offerings into an excellent performance-based experience. Students will research a self-selected topic and complete a composition, work with a mentor on a self-selected project related to the topic, use technology to prepare a presentation on the topic, and defend their project in front of a panel of judges. Technology tools and the Internet will be integral support components for students who are completing this process.

Center for 21st Century Skills

The Center was established in 2005 and is a public-private partnership operating out of the Office of the Governor under the auspices of the NC Business Committee for Education (NCBCE). The work of Center includes actively partnering with business leaders, educators and policymakers to create new curricula, new assessments, and new ways of linking student work in the classroom to the workplace in the 21st century. It brings together current innovative reform efforts as well as implementing new ones to develop meaningful assessments and curricula that reflect the knowledge necessary for success in the 21st century. The Center is also working to improve and expand professional development for educators that focus on 21st century skills.

Center's focus on Assessments

The current state assessments, including the End of Grade and End of Course Tests, were developed to monitor how well each teacher was covering the NC Standard Course of Study. In 1999, the role of these summative assessments was expanded to measure student achievement through the student accountability standards. In addition to these multiple choice tests, students must demonstrate mastery on two performance-based measures before they can earn a diploma - the computer skills test and a graduation project.

In order to provide comprehensive feedback to students on 21st Century workplace skills, formative assessments are critical and technology tools and infrastructure is necessary to provide feedback quickly. Formative assessments unlike summative assessments provide information throughout the year on the progress students are making toward achievement in the curriculum that teaches are teaching. These assessments require students apply knowledge in a relevant situation, work in teams, and employ critical thinking skills. The assessments should also provide information to teachers regarding the effectiveness of their instruction and allow them to redirect emphasis when necessary. Technology is the core for these assessments not only as the tool for student performance, but also as the vehicle for delivery from the state to the field. Teachers can receive feedback quicker which allows for more continuous improvement as opposed to waiting to the end of the year.

As part of its ongoing transition to its Future Ready Students strategic plan, the State Board of Education (SBE) appointed a Blue Ribbon Commission on Testing and Accountability in May 2007. The outcome for the Commission is to make recommendations about North Carolina's ABC's Accountability Program and how it supports the SBE's Future Ready Students. Part of its work is to review the types of testing necessary to ensure that students are learning to be globally competitive. Its review of the current EOG and EOC tests includes determining if measures are included for 21st century skills like teams building and collaboration. The Commission is in process of doing its work and is scheduled to report its recommendations to the SBE in January 2008.

Essential Element 2: **Technology Tools in the Classrooms**

Twenty-first Century schools are exciting places in which to teach and learn! In general, there are more small group learning activities and less whole-class, teacher-centered instruction. Since the goal of education is to teach children how to learn, not necessarily what to learn, most teachers use an inquiry-based, constructivist approach in which students solve problems. Learning is based on prior knowledge and focused around guided research and systematically cultivated higher order thinking skills.

All schools are supported by a team of school library media and technology specialists who collaborate with classroom teachers to provide a resource-rich, technology-rich teaching and learning environment while simultaneously lowering student/teacher ratio to address differentiated learning needs. They, in turn, are supported by district leaders who ensure that each school has facilities and personnel necessary for a 21st Century education. This support includes access for all staff to continual professional development in technology-related areas and a system that assesses the use of technology for increasing student achievement.

Besides individual classroom spaces - many with movable walls and flexible desk/table/cubicle configurations - each school has a media center, computer lab(s), and a digital TV studio. These facilities are open beyond the traditional school day. Students and the community have extended learning opportunities early in the morning, late into the evening, and on weekends. A variety of school library media and technology personnel, both instructional and technical, support all these spaces, working collaboratively with teachers, administrators, and community members to provide technology and resources within a 24/7 learning environment for every citizen.

The resources are ubiquitous! High speed Internet access, that is delivered by a combination of a state operated K20 Education backbone and rich partnerships with commercial providers, allows students and teachers to use a wide variety of resources like NC WiseOwl, video streaming, online courses, video conferencing, and project-based collaborative environments. The Web, the Deep Web, and advanced research networks such as Internet 2 and/or National Lambda Rail, are all options, as teachers help students learn to discern which resources, experts, or platforms are the most appropriate for their particular project or course of study. Web 2.0 tools have their classroom applications, giving students a public voice through blogs, an opportunity to collaborate through wikis, a place to share photographs with Flickr, and a new way to study for End-Of-Grade Tests via podcasts and giving teachers, school leaders and school staff such as literacy coaches and media specialists/library media coordinators additional opportunities to interact with their peers and form professional communities to share ideas, innovations and best practices. Even simulations and multi-user virtual environments (MUVEs) are acknowledging the educational potential of problem-solving in a game-playing format.

The technology itself is ubiquitous as well. Every student has access to a computing device at school and at home, with a variety of peripherals to supplement its use including assistive/adaptive devices for special needs. Teachers and administrators are provided a

variety of tools—handheld devices for easy, walk-around assessment and classroom/building management chores; a tablet computer for field trips, work at home, meetings, and notetaking; and a desktop for data analysis, multimedia production, and creating documents and reports.

Each classroom is outfitted with an interactive white board, panel, or wireless tablet and data projector; document camera; scanner; classroom audio system; a classroom set of individual student response devices; digital and video cameras; a telephone; one or more multimedia work stations that include printers; PDAs for scheduling, content sharing, and geocaching; science probeware for experiments; digital microscopes; and graphing scientific calculators for the upper grades. Technology is transparent, with students and teachers naturally using appropriate technology resources as needs arise, treating them as problem-solving, enabling tools.

The technology is used developmentally, with applications and tools chosen based on the educational- and age-appropriateness for the students involved. For instance, in primary schools learning centers abound, with computers sharing the stage with housekeeping stations, sand and water play stations, and spaces for small-group instruction and quiet reading. Children walk up to the interactive digital white board to identify vowels or solve simple addition problems while their classmates watch from their seats, eagerly waiting their turns for teacher praise and validation. At reading assessment time, teachers follow along and log students' progress using hand-held devices, eventually downloading their data for comparative analysis. Even the youngest children take digital pictures or videos, using them to tell a story or to document a process or project. Teachers demonstrate early science concepts using digital microscopes and probeware, building on all children's natural curiosity of the world around them.

Young students learn to use the library media center immediately, moving back and forth between it and their classrooms with great regularity, even several times a day. They are thrilled with the responsibility they have been given of checking in and out their books through the automated circulation system. The library media coordinator and technology facilitator collaborate consistently with these classroom teachers in providing research projects so that these primary students learn what it means to become problem-solvers and independent learners. They are using early reading Web sites and software, making their own classroom books, hosting school-wide television shows, and sending encouraging e-mails to sick classmates early in their school careers.

As students move into upper elementary grades, they are gradually introduced to one-to-one computing. Students use their own computing device for research, project development, and possibly extra assistance in grasping complex tasks. The learning center approach of the primary grades morphs into small group work, with children of various interests and abilities taught how to accept responsibility for their own and others' work within the project-based learning environment. The media coordinator, technology facilitator, and classroom teachers work together to design units and projects based on the curriculum found in the North Carolina Standard Course of Study that supplement, expand, and enhance instruction. Students move in and out of the media center, continuing to

explore their reading interests, both personal and curriculum-related. They also begin the exciting process of small group research work that combines blocks of classroom and media center time, as they gather a variety of resources—books, websites, videos, personal interviews—and pull information from all these sources to create new knowledge-based projects. These projects could be as diverse as an extended interview or video for the school's daily TV program, a PowerPoint presentation for the next PTO program, a teacher-moderated wiki to create a science dictionary, a group-created Web site, or a project book bound and housed in the school's library media center.

This independent-learner-centered environment is continued and increased throughout a student's middle school career. Once again student abilities and skills are acknowledged and built upon as teachers use technology resources and project-based learning to differentiate instruction. Interactive digital whiteboards and individual student response systems help teachers to determine the percentage of students who understand certain skills or concepts, allowing re-teaching for either the whole class or individual students as necessary. Some students will be introduced to online courses. Others may use online modules from a learning object repository that illustrate specific concepts for review or that enrich instruction. Still others will be paired with community members, distant experts, or students from other states or countries as they work together on common classroom or personal projects. Teachers continue to plan, structure, and guide these endeavors carefully. They rely upon media and technology personnel to move in and out of their classrooms, just as students cycle through the media and technology facilities. This effectively reduces class size, provides individual attention where needed, and offers the chance to encourage early adolescents to develop special relationships with positive role models.

In high schools, students use technology to transform their educational environment. Some students may choose to expand their school day, taking traditional face-to-face classes during school hours and online courses at other times. Others may choose to supplement the school day with one or more online courses, while a small number of teens may opt out of traditional high school altogether and graduate from an online program. Colleges and universities provide video and online instruction so that high school students can begin to gain college credit. High school graduation projects are enabled by technology tools that help students collaborate with scientists or researchers from around the world. Students may physically leave the high school campus and remain connected to their schools via e-mail, cell phones, webcams, and chat. Media and technology personnel and technology tools continue to be vital in this learning equation as they help students research potential learning partners and situations, complete large projects and papers, and explore and provide new learning technologies and resources.

Technology is especially helpful to our most challenged students. Computers help ADD and LD children focus on the task at hand; interactive programs provide extra help when needed; assistive technologies give physically challenged children the tools to communicate; successful experiences with interactive digital white boards can produce a smile or a few first words from an autistic child; and a school television studio can convince an abused child that life is worth living; while blogs can encourage students to write and

communicate with others. Technology success can equal self-esteem and confidence in children who need hope and encouragement, opening doors where they thought there were none.

Technology in schools is an amazing starter, accelerator and motivator, yet it is meaningless without the careful guidance and nurturing of classroom teachers and media and technology personnel. These are the individuals who bring the rigor, relevance, and relationships so important to 21st Century learning; technology is the tool that supports their efforts to produce relevant and high impact student outcomes.

Model Programs

There are two primary models that have been used in North Carolina to demonstrate the use of technology tools including the addition of personnel and training for teachers. One is the North Carolina IMPACT model that has been supported through a federal grant and a second is the NC Technology Association (NCTA) Education Foundations' Technology Demonstration Project which is also supported through federal funding and is a business initiative.

Research Highlights from the IMPACT Model Schools Grant

The North Carolina Department of Public Instruction (NCDPI), in partnership with North Carolina State University (NCSU), the Technology in Learning (TiL) unit of the SERVE Center at UNC Greensboro, and the State Educational Technology Directors Association (SETDA), conducted the Looking at North Carolina Educational Technology (LANCET) project in order to study the implementation of the state's educational technology IMPACT model and communicate its effect on schools, teaching practices, and student achievement. Specific components of this comprehensive program model were implemented through formula grants from the Enhancing Education Through Technology (EETT) component of the No Child Left Behind (NCLB) legislation. The complete model was implemented fully in ten schools that were awarded EETT competitive grants. Since the original IMPACT model was implemented primarily in elementary schools, NCDPI is now conducting a similar evaluation with IMPACT II schools—all traditionally structured middle schools—and with the School Technology Pilot high schools.

IMPACT MODEL

External Summative Evaluation of North Carolina's IMPACT Model Schools Grant from North Carolina State University/Friday Institute for Education Innovation:

Student Achievement: Math

After controlling for background demographics such as race, sex, grade, days absent, parent education, and free/reduced lunch status:

- For Year 00 (baseline) to Year 02: IMPACT students had stronger growth curves than comparison school students. Higher grades had stronger differences.

- For Year 00 (baseline) to Year 02: IMPACT students were less likely to drop achievement level, and more likely to increase achievement level over these three years than comparison students.
    - The odds of IMPACT students dropping one or more achievement levels were 25% less than comparison students
    - The odds of IMPACT students increasing one or more achievement levels were 37% higher than comparison students.
- When looking at pass/fail rates for the EOGs, in Year 00 IMPACT students were significantly less likely to pass the math EOG than comparison students. By Year 03, IMPACT students were more likely to pass the test.
- For Year 00 (baseline) to Year 02: When looking at change in passing status (going from passing to failing or failing to passing):
    - the odds that IMPACT students would go from non-passing to passing status over the three years were 42% higher than that for comparison students
    - in Year 03, the odds of IMPACT students passing the Math EOG were 24% higher than that of comparison. This effect was stronger in earlier grades, and by 6th grade was nonexistent (for year 03 only).

Student Achievement: Reading

After controlling for background demographics such as race, sex, grade, days absent, parent education, and free/reduced lunch status:

- In general, IMPACT students had stronger growth curves, particularly in the lower and upper (3rd, 7th) grades than middle (5th).
- IMPACT students were more likely to increase achievement level from Year 00 to Year 03, but that was a small sample (N=1428). The odds of IMPACT students increasing achievement level from Year 01 to 03 were 3 times that of comparison students.
- When looking at pass/fail rates for the EOGs, in Year 00 IMPACT students were significantly less likely to pass the reading EOG than comparison students. By Year 03, IMPACT students were equally likely to pass the test.
- When looking at change in passing status, the odds that IMPACT students would increase from failing to passing over the four years were 55% higher than the odds for comparison students. When looking at Year 01 to 03 with the larger sample, the odds were 43% higher for IMPACT students.

Teacher Retention

- Classroom teachers in IMPACT schools were more likely to be retained over this 3 year period than comparison school classroom teachers. This effect was particularly strong for beginning (0-3 years) teachers and master (11+ years) teachers.

Technology Use

- Relative to comparison students, a higher percentage of IMPACT students reported using computers in core subject areas, for conducting research, for word processing, and for presentations; these differences were highly significant across all four areas.
- Based on the School Technology Needs Assessment (STNA) developed by SERVE and used by NCSU, IMPACT teachers perceived that their schools were more

supportive of risk-taking, and had more linkages to the community than did comparison schools.

- ISTE NETS-T: IMPACT teachers started out less confident (about a half standard deviation below) than their comparison teacher counterparts, but had substantially stronger growth so that by the beginning of the second year of the project, IMPACT teachers had much higher overall scores on the NETS-T (about one-half standard deviation *above* the comparison teachers)
- Attitudes: IMPACT teachers consistently saw IT as more useful, and had more positive attitudes toward the usefulness of email, the World Wide Web, multimedia in the classroom, and instructional technology for teachers than the comparison teachers. Ironically, comparison school teachers were more likely to view student interaction with computers more positively.
- There were few differences in classroom technology use for IMPACT and comparison teachers prior to the IMPACT intervention, but by 2006 IMPACT teachers reported using most classroom technologies more frequently than comparison school teachers.

Media Center Use

- Visitation to the media center by students increased at IMPACT schools in all three years of the project. Overall, visitation declined for comparison students, although there was some improvement in Year 3, when several comparison schools adopted flexible access policies.

Leadership

- IMPACT principals who were at their schools for all three years of the project made gains in every measured aspect of their leadership skills, according to their staff, based on Kouzes and Posner's Leadership Practices Inventory.
- Principals grew most in terms of "Challenging the Process" and "Inspiring a Shared Vision."
- Media coordinators and technology facilitators outscored principals on a 360˚ measure of leadership qualities (using the Kouzes and Posner instrument), indicating that teachers value them as school leaders.
- Media coordinators and technology facilitators scored highest on "Enabling Others to Act" and "Encouraging the Heart."

Formative Evaluation within the IMPACT Model Schools

As part of the LANCET Grant, the Til at SERVE Evaluation Planning Web site has been launched, in which the evaluation planning process is documented and a variety of resources are delineated and linked.
(http://www.seirtec.org/_evaluation/inst/worksheets.html)

Three instruments are available to schools across NC as a result of the LANCET Grant:

- LoFTI: Looking for Technology Integration
  http://www.seirtec.org/_evaluation/lofti.htm

- TNA: School Technology Needs Assessment http://www.seirtec.org/_evaluation/stna.html
- Collaboration Toolkithttp://www.ncwiseowl.org/impact/toolkit.doc

- Using Technology to Support a School-Family-Community Partnership Surveyhttp://www.serve.org/Evaluation/Capacity/EvalFramework/resources/partnershipsurvey.php

To learn more, visit:

- *IMPACT: Guidelines for North Carolina Media and Technology Programs* http://www.ncwiseowl.org/zones/mediatech/impact/IMPACT.pdf
- IMPACT Model School Grant http://www.ncwiseowl.org/Impact/igrant/default.htm
- LANCET Grant http://www.ncwiseowl.org/Impact/LANCET/default.htm

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NCTA Demonstration Model

NC Technology Association (NCTA) Education Foundation obtained federal funding from the U. S. Department of Education to conduct seven (7) Technology Demonstration Projects in North Carolina schools. The seven (7) projects included six (6) elementary schools and one (1) middle school. The projects are:

- Efland Project, Efland, North Carolina
- Oak Lane Project, Hurdle Mills, North Carolina
- Liberty Project, Liberty North Carolina
- Aberdeen Project, Aberdeen, North Carolina
- McGee Project, Angier, North Carolina
- Riverbend Project, Clyde, North Carolina
- Southside/Ashpole Project, Rowland, North Carolina

The purposes of these projects is to power up the participating schools with complete technology tools and provide professional development for all teachers in the schools. NCTA's goal was to bring to the schools the needed resources so that they could work toward implementing their five-year technology plan and demonstrate the effects on student learning.

Based on evaluation of the project, the lessons learned are as follows:

1. The equipment and software installations should be done prior to the completion of training.
2. A strong onsite technology leader to carry out the day-to-day follow-up items is essential.

3. Ensuring that the technical support for equipment and software implementation is ready to go upon equipment receipt is critical.
4. A solid, strong relationship between the district office and the school administration is critical.
5. An ongoing mentoring and training plan to further embellish the technology and utilize all instructional strategies is critical.

Anecdotal comments from teachers about the project include:

"Students who are not academically inclined find a new interest in their education and those who are already plugged in educationally are even more excited about learning."

"Every child is teachable and technology is a means of helping every child to be successful by working at his own pace."

"Our school population consists of many diverse populations both among students and staff. This program has shown how to adapt curriculum to reach students of all backgrounds and abilities."

"This program has strengthened the staff members of our school. We have shared ideas and been able to draw upon one another's' strengths/areas of expertise in order to complete assignments, increase unity among teachers and improve the overall quality of teaching."

"Receiving this grant has leveled the playing field for the children. With this grant the children are able to use technology they need to succeed in their education and in life."

Both the Impact and NCTA models are examples of how providing the necessary tools and support are essential to utilizing technology so that it has an impact on teaching and learning.

As the state continues to invest in technology and move our schools as rapidly as possible into the 21st Century, it is crucial to invest in teacher training so that educators will embrace the use of technology and the classroom benefits it offers. Best practices learned in previous classroom technology implementations strongly support the strategy of getting any new technology into the hands of the teachers first, providing them with the training resources, and allowing for "ramp-up" time so that they are armed with sufficient knowledge and confidence as the technology is rolled out to the students.

Providing teachers and students with the tools to become 21st Century environments is just beginning. Only about 20% of North Carolina schools are currently future-ready in all senses of the term. While 99.3% of our schools are connected to the Internet, the available bandwidth and the individual school network is not adequate or consistent for 21st Century applications. This is particularly true in the far eastern and western areas of the state. While we are moving toward 1:1 computer ratios, with a 3.4 student to computer ratio, only

15.17% of our schools have full-time, building-level technology facilitators. Providing future-ready classrooms will also be a challenge. Currently:

- 8.09% of North Carolina classrooms have at least one digital camera,
- 6.20% classrooms have an interactive whiteboard,
- 17.6% have a digital projector
- 3.24% have a document camera

The estimated costs for equipping each North Carolina classroom with the technology to be "future ready" is $7,233 per classroom. This base-line cost to equip these classrooms includes digital white board technology, data projectors, computers, document cameras, a technology facilitator and other technical personnel for each school is based on FY 2006-07 estimated costs.

These costs are large, but the larger question has become: Can North Carolina affords NOT to provide a 21st Century teaching and learning environment for its citizens? This is not only the big education question; it is the big economic question.

Essential Element 3: Personnel and Professional Development

LEA and School Personnel and Professional Development
Research tells us that teachers will use technology more readily and more effectively if they have the proper support.
http://www.ed.gov/pubs/EdReformStudies/EdTech/approaches.html#support

This support includes not only an individual with the skills to keep the various technologies updated and running—the technician—but also a properly prepared and trained teacher who understands and can teach others how these technologies can be used in the instructional process—the technology facilitator. These individuals join a school's library media coordinator to form a 21st Century learning team that supports teachers and students as they teach and learn with technology.

What are the roles of the technology facilitator and technician? As stated above, technicians keep a school's client and networking hardware and software (platforms, administrative, content related) updated and in good working order. They troubleshoot the network, repair equipment, install new machines and software, and just generally keep all the technologies running. When everything is going smoothly, technicians can be seen throughout the school interacting with teachers and students as part of the 21st Century learning team, facilitating a student tech help team, helping older students complete a PowerPoint project in the computer lab, or advising students as they produce the morning news show.

While technology facilitators are certainly able to make typical equipment repairs, this is not their primary responsibility. They are focused on student outcomes. The technician allows

technology facilitators to spend a majority of their time working with teachers and students. The technology facilitator's job description, approved by the State Board of Education, describes a technology facilitator's primary functions as:

- Planning and facilitating teaching and learning
- Planning and facilitating information access and delivery
- Planning and facilitating program administration

It is important to note the phrase "planning and facilitating" in each of the functions. Similar to their school library media coordinator counterparts' function wording, it describes the critical role that the 21st Century learning team plays in the instructional process. (See Attachment 3 for Technology Facilitator Job Description.)

One of the keys to 21st Century learning support that is offered by the school level technology facilitator and technician is teacher professional development. Professional development is central in ensuring the effective use of technology in the school and classroom. This professional development takes many forms:

- One-to-one, just-in-time training when teachers (or students!) need to learn new skills or how to use a new piece of equipment.
- Modeling the use of technologies within the classroom for teachers so that they might gain the comfort level necessary to use it independently.
- Conducting large group training or workshops.
- Collaborating with the school library media coordinator and classroom teachers to create lessons or units of instruction.
- Interacting with technology facilitators and technicians within their district, region and across the state to share ideas, innovation and best practice.
- Online workshop in which teachers work with mentors and peers through videoconferencing and/or Internet-based interactions, to provide access to professional development that overcomes barriers of distance and schedules.

The collaborative planning process, a continuous professional development experience for all involved, is critical to 21st Century teaching and learning, and technology facilitators are major players within these planning meetings. Through the collaborative planning process, teachers are able to brainstorm with other teachers, the school library media coordinator, and the technology facilitator, finding new ways of presenting information, broadening the number and kinds of resources they can bring to the lesson or unit, and making sure each child's learning style has activities and resources to address it.

When the media coordinator and technology facilitator are brought into the team as instructional partners, each can work with small groups of students, thus freeing up classroom teachers to teach their own small groups of students. Class size has been reduced and students have the opportunity to have individual needs addressed several times throughout the school day or week.

Central office technical support is also important to the success of 21st Century schools. Overseeing all technology initiatives, both instructional and technical, is the Technology Director. He or she is primarily focused on the development, implementation, operation, monitoring, and evaluation of the technology program for the school system. This individual provides leadership in identifying hardware and software purchases, ensuring that they are consistent with the school system instructional technology plan and state technology guidelines. The employee coordinates, and may deliver, staff development. He/she oversees the work of the remainder of the technical and instructional technology staff. He/She also drives collaboration between school technology professionals throughout the district, region and across the state to share ideas, innovation and best practice. Finally, he/she is the lead interface for the district on all issues related to the LEAs use of the state's K20 education backbone, purchase and contractual arrangements with the districts transport provider(s) and Internet Service Provider(s) and administration of the districts use of the federal eRate Program.

Central office technicians repair equipment, install hardware and software, and in general support building-level technicians as well as make sure all central office equipment is up and running. Depending on the size of the school system, they can range from Technicians 1 to Technicians 3. More experienced technical expertise is needed for wide area network (WAN) and local area network (LAN) management and maintenance.

Members of the Central Office Technology Support team include:

The Wide Area Network (WAN) Engineer. The WAN Engineer is responsible for designing and implementing wide area networks in a local school agency. He or she:

- Designs and implements wide area networks including network servers, hubs, routers, workstations and other peripheral devices.
- Installs and configures wide area network servers for email, Internet, and Proxy services.
- Installs and configures all necessary telecommunication devices.
- Operates and maintains wide area networks, tracks significant problems, monitors performance, and performs upgrades to hardware and software as required. Installs or modifies existing installations of networked computer hardware, software, and other components.
- Participates in long- and short-range technology planning.
- Trains technical staff at the system and building level to follow proper operating procedures necessary to maintain the integrity of the network.
- Maintains documentation regarding network configurations, operating procedures, and service records relating to network hardware and software.
- Assists in developing training for building level faculty and staff in the proper operation of the wide and local area networks.

The Local Area Network (LAN) Engineer is responsible for designing and implementing local area networks in a school environment.

- Installs local area networks including network servers, hubs, routers, workstations, printers, and other peripheral devices.
- Operate and maintain local area networks, track significant problems, monitor performance, and perform upgrades to hardware and software as required. Install or modify existing installations of networked computer hardware, software, and other components.
- Participates in long and short range technology planning.
- Trains technical staff at the building level to follow proper operating procedures necessary to maintain the integrity of the network.
- Maintains documentation regarding network configuration, operating procedures, and service records relating to network hardware and software.
- Assists in developing and providing training to building level faculty and staff in the proper operation of the local area network.

All these individuals, in collaboration with the school library media coordinator at the building level and the media supervisor at the central office level support the infrastructure needed for 21st Century teaching and learning in the LEAs and schools.

State and Regional Support Services

Infrastructure support does not end at the LEA and school. The School Connectivity Initiative, funded at $12 million-R during the 2007 session of the General Assembly, is focused on connecting all public schools in North Carolina to a single state wide network for education. The School Connectivity Initiative redefines the role of state support and service for technology in education. This initiative described in the next section: Essential Element 4 identifies and begins to establish the kinds of services necessary to support the LEAs and schools as they continue to transition to a 21st Century Learning environment where technology is transparent or integrated part of the daily operation of the LEA and schools. As NC moves to a technology rich environment supported by a statewide network, functions typically done at the LEA and school will require different roles, strategies and levels of support. For instance, there is a need for skilled network engineers and other technical support to assist with designing the appropriate infrastructures that can fully utilize the statewide network as well as e-rate consultants to assist in the planning and funding for the infrastructure. The robust network means more collaboration and sharing of resources and information within LEAs and their schools, with other LEAs and their schools and continues transitioning as NC moves towards a seamless PK-20 Learning Environment supported by a robust statewide education network. This will be an evolving process over the next 3 to 5 years with the initial focus on on connecting all public education entities into the state to a common backbone network. Roles, support and services will continue to evolve throughout this period of time and move towards an operational and organizational structure that will support the unique needs of a PK-20 education network.

Essential Element 4: **Connectivity, Networks and Accountability**

Essential Element 4 brings the previous 3 Elements together through a statewide network that provides connectivity and mechanisms for sharing resources so that all of public

education in North Carolina can work together more effectively and seamlessly. Essential Element 1 outlines the policy framework adopted by the State Board of Education and the content (instruction, curriculum, and assessments) necessary for 21st learning. Essential Elements 2 and 3 provides examples and explanations about the kinds of infrastructure and technology tools needed to help facilitate the content. They also explain the staff support necessary to use 21st century technology tools and the help they provide to facilitate teaching and learning. However, providing the necessary content, tools and personnel alone are not sufficient to operate in a 21st century school or workplace. Teachers and students need the capacity to connect to each other, to other classrooms, to other schools, universities, colleges, the internet and other places to access high quality resources and information. This brings us to the 4th and final essential element-connectivity and networks- the mechanism to create the interaction and access to information. Connectivity is more than the available bandwidth, it is about creating the capacity to utilize technology as part of the work done in schools every day that facilitates teaching and learning. While the first 3 Essential elements are about preparing the school to use this bandwidth and a robust, scalable and secure network to provide access and opportunity, the connectivity and network creates the capacity to people, ideas and conversations that are the real crux of innovation and success in a global economy.

The General Assembly chose to begin implementing the School Connectivity Initiative proposed in the 2007 Joint Legislative Technology Report by allocating $12 million R funds so that North Carolina can begin to develop a statewide network for education by expanding the existing North Carolina Research and Education Network (NCREN). This initiative is based on the results of the study completed in May 2006 by e-NC that recommends the state invest in a statewide network to support the public schools by expanding the current NC Research and Education Network (NCREN). NCREN currently provides connectivity and networking for the North Carolina's Universalities, some of the private Universities and some of the Community Colleges. NCREN operator, MCNC, has in its two plus decades of service to universities, successfully demonstrated how a robust network can provide equal access, as well as facilitates and support learning. Additional validation for the recommendation of leveraging NCREN as the foundation for a common education backbone network for the state came through the General Assembly's provision of $6 millionNR in funding in 2006 to pilot various types of connectivity/networking initiatives and how they could be used to support and sustain 21st century learning. Through these pilot programs, fifteen LEA's are now connected directly to NCREN and feedback from these LEA's has been tremendously positive.

The planning team for the pilots, coordinated through the Friday Institute at NC State University, determined that 3 to 6 sites would be identified in various stages of maturity with technology and connectivity. The goals for the pilot sites support the 4 essential elements outlined in this report and the premise that all 4 essential elements must be in place in order to sustain 21st Century schools. The goals include:

1. Expand the number of public schools serving PreK-12 with broadband connectivity;

2. Provide “last mile” connectivity and enhance development of regional broadband networks;
3. Infuse technology into schools’ instructional efforts;
4. Maximize the use of e-Rate;
5. Revise school technology plans.

The 2006 pilots are described below and provide information about the various types of networking models and technology tools being used to support 21st century learning.

2006 Pilots

Roanoke River Valley Education Consortium (RRVEC)
RRVEC comprises the following LEAs in the Northeast: Warren County, Northampton County. Weldon City, Halifax County, Bertie County, Hertford County

This project is a collaborative with the Golden Leaf Foundation to provide connectivity, routing equipment and inside wiring for Hertford, Northampton (East and West), and Weldon City High Schools. North Hampton and Hertford are connected to the NCREN backbone point of presence in Greenville and use Embarq metropolitan Ethernet. This effort has enabled the RRVEC to utilize the video conferencing for all High Schools in the consortium. NC DPI has provided a grant to support the procurement of ITS video services to manage the operation and scheduling of these video conferencing resources on behalf of the consortium. The video conferencing solution will be used to support sharing of instructors across LEAs, to access live content (e.g., sourced by the NC School of Science and Math), NC Virtual Public School, Learn and Earn On-line and for online professional development.

WinstonNet Consortium
The WinstonNet Consortium comprises 10 LEAs: Davie County, Yadkin County, Surry County, Davidson County, Winston Salem/Forsyth, Mt. Airy City, Thomasville City, Elkin City, Lexington City, and Stokes County

The consortium is piloting connecting LEAs to a shared backbone through WinstonNet, which is a regional backbone network, that connects to NCREN with 10 LEAs around Winston in the North Central Region. This will ensure that that NCVPS, Learn and Earn On-Line and other state applications like video conferencing to support instruction and professional development, interactive instructional tools, content streaming and virtual computing can be delivered with quality performance. They have engaged IBM as a private sector partner and Wake Forest University as a University partner. Such a regional collaboration around computing virtualization initiates what should be a common and growing benefit a statewide education network – allowing regional sharing of compute, storage, application, software licensing, and human resources.

Wilson County
The Wilson County is collaborating with SAS, Golden Leaf Foundation and the School Connectivity Pilot funded in the 2007 General Assembly to build a one-to-one laptop-

computing program in Wilson's Hunt HS. SAS has provided funding laptops for all teachers and provided all classrooms with projectors and related 21st century classroom peripherals. Student lap tops have been provided through a Golden Leaf Foundation grant and the Connectivity pilot has developed a network to support 1:1 laptops to all students and teachers in the school. The connectivity project's role includes the development of school and LEA network blueprints in support of 1-to-1 requirements – with a particular emphasis on wireless connectivity. This pilot is also a case study for how the funds made available through the connectivity initiative can be applied to supporting new and progressive instructional technology services.

Western North Carolina (WNC) EdNET Consortium

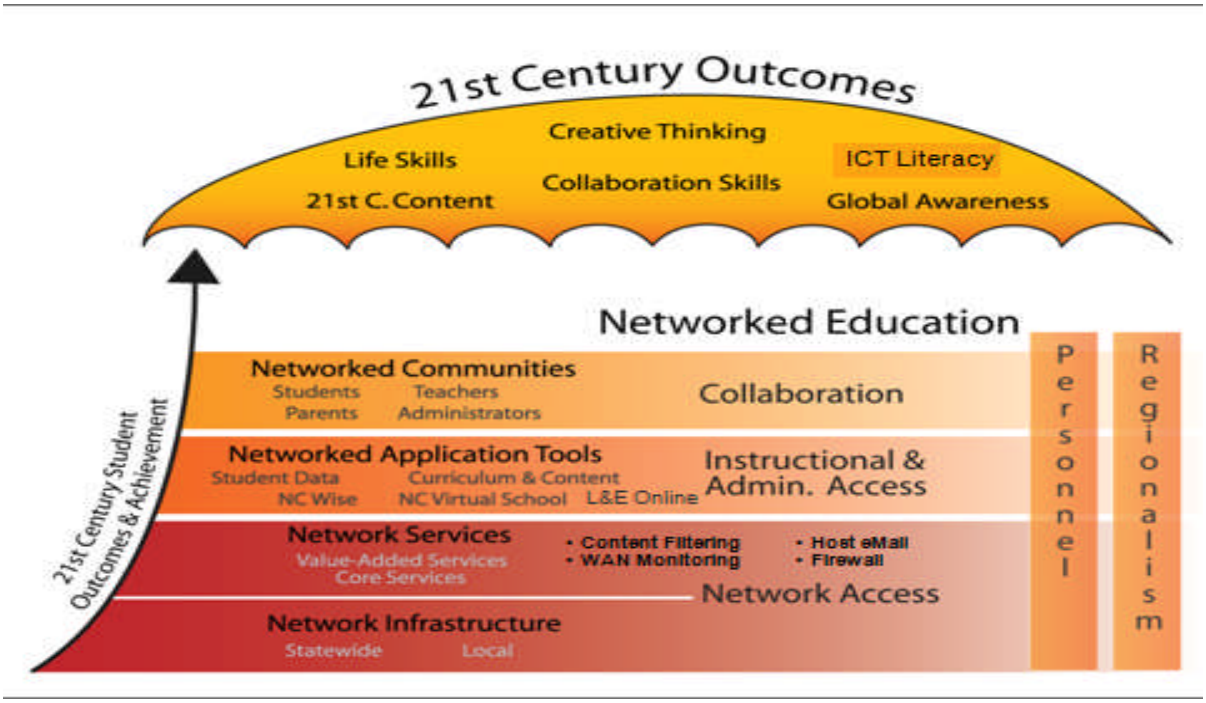
The WNC EdNet Consortium comprises a subset of the western RESA - Cherokee County, Cherokee Central Tribal, Clay County, Graham County, Jackson County, Macon County and Swain County

The consortium has raised over $3.5M from the Golden Leaf Foundation, the Cherokee Preservation Foundation, and from the Appalachian Regional Commission to support the development of a regional education network. The region lacks commercial provider connectivity offerings that can deliver 10's of megabits per second capacities to public schools. In response to that reality the consortium issued an RFP to support development of fiber network capabilities in the region. Due to lack of service providers, the connectivity pilot has partnered with GLF, Balsam West, and the WNC EdNET consortium to fund the construction of fiber connections to all of the schools in 6 LEAs. Backbone traffic will, as with these other pilots, be routed over the NCREN backbone which peers with the regional networks supporting the WNC EdNet consortium.

The lessons learned in these pilots have already assisted in revising the program goals for the School Connectivity Initiative to the following:

1. Develop a sustainable funding model
2. Provide statewide e-Rate support
3. Provide "equity of access" & connectivity effectiveness
4. Build the NC Education Network (NC EdNET) leveraging NCREN as the foundation
5. Foster public-private partnership

The chart below provides a graphic of the overall structure of how the state wide network will support 21st Century Outcomes previously described in this report including the program goals and services available to all LEAs and schools.



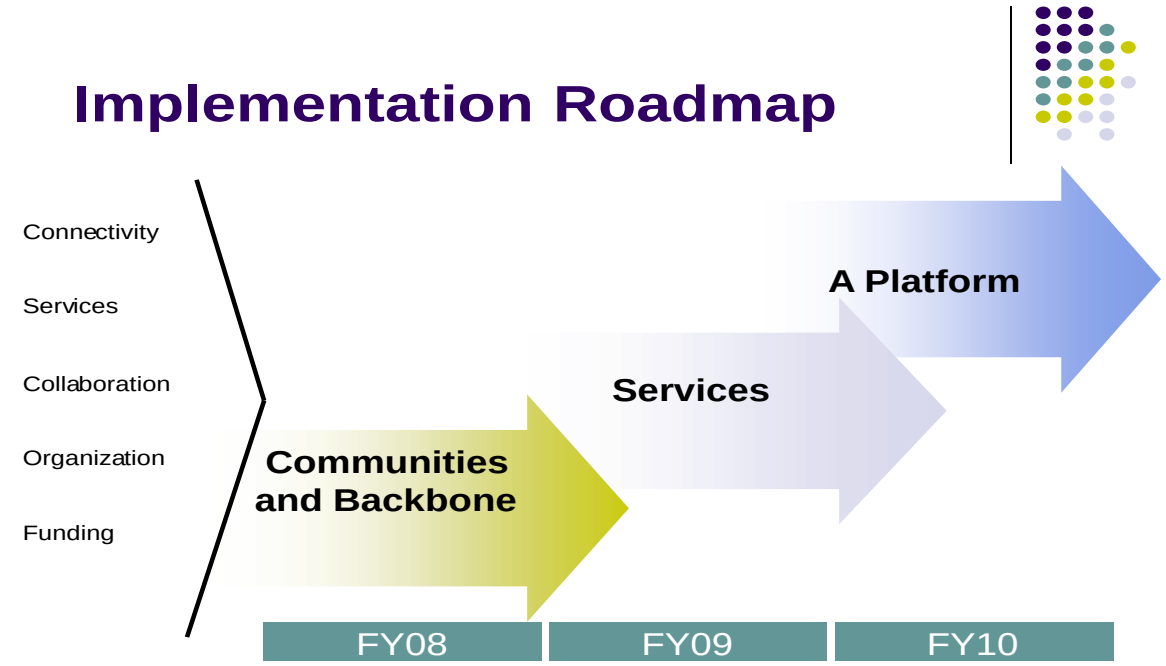
North Carolina House Bill 1473 codified in July 2007 provides for $12M in recurring funding that…

"…shall be used for broadband access, equipment, and support services that create, improve, and sustain equity of access for instructional opportunities for public school students and educators…" [§§ 7.28.(a)].

As a result of action by the General Assembly the School Connectivity Initiative is in year one of implementation. Simply put, LEAs will be connected to the NCREN statewide network (Attachment 4), the LEA funds being used to provide connectivity can be reinvested back into the schools to upgrade internal networks and technology tools. "Last mile" connectivity to schools and classrooms to the State network is an important part of the plan. Private sector providers of this service are integral to provision of this connectivity and LEAs should seek to work with service providers to meet their connectivity needs.

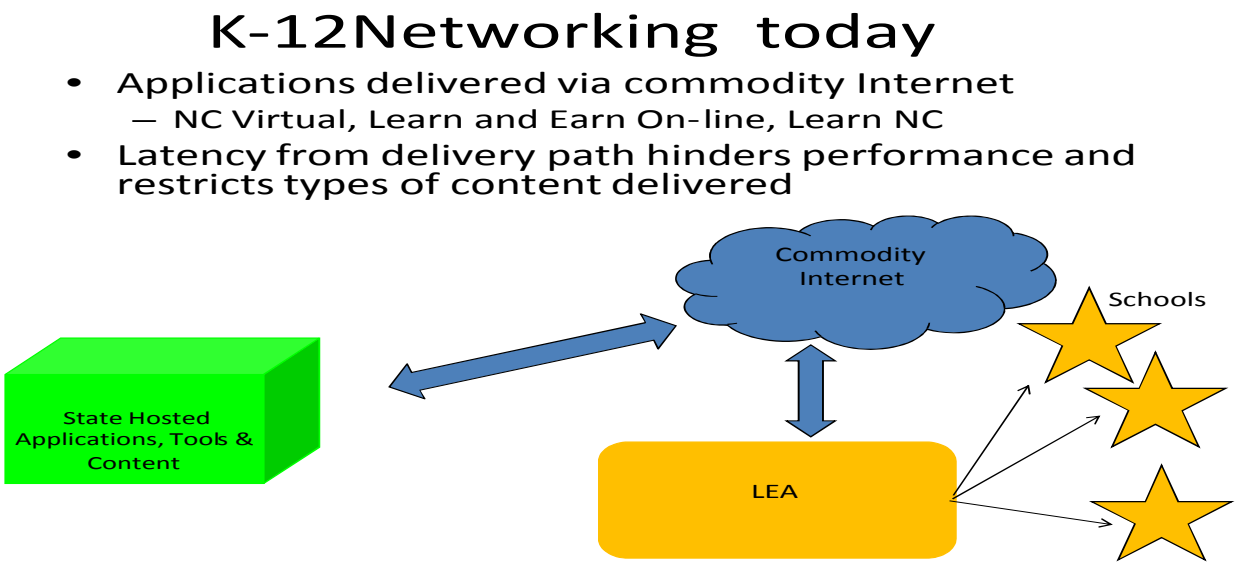
The Implementation Chart below provides a basic timeline for implementation of the School Connectivity Initiative. During 2007-08 the statewide backbone will be upgraded to so that LEAs and schools can be connected. Engineers and e-rate consultants are in the process of assessing schools and developing plans for upgrading their infrastructure in readiness to connect to the network. The e-rate consultants are providing direct support to the schools and help transition to a statewide plan for e-rate reimbursement so that NC will be able to

take maximum advantage of this federal program. These and other services should be in place by 2009. The plan will be to fully develop the statewide network, organizational structure and services referred to as NC Education Network (NCEdNet) by 2010 that will include all public schools. In addition, concurrent work must l continue to include North Carolina's Community Colleges as part of the K20 backbone. This will enable seamless content and administrative content sharing across the three levels of public education in North Carolina, as the UNC System universities as well as numerous North Carolina private colleges and universities are already a part of the network.

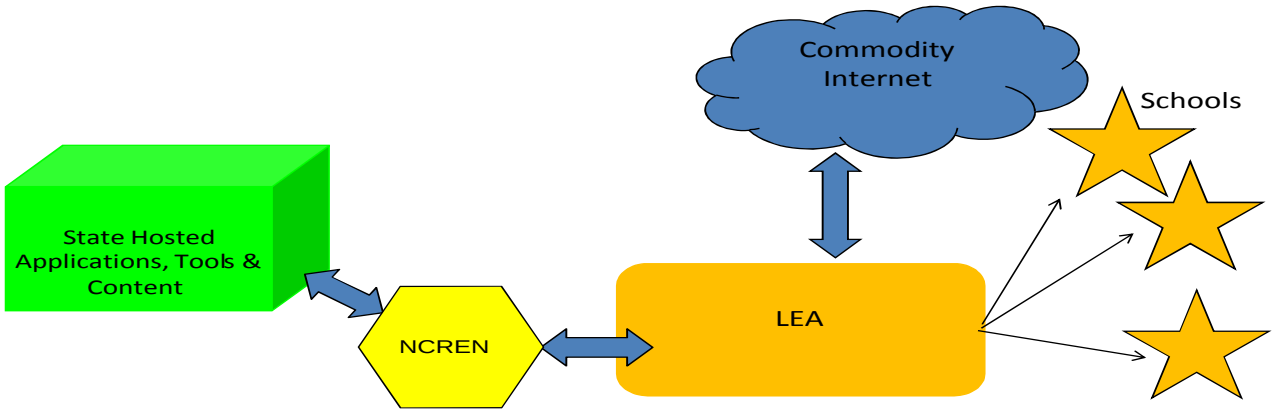


For more information about the School Connectivity Initiative, please go to: www.connectivity.fi.ncsu.edu.

The graphic below provides a picture of how schools connect to the internet today and get access to applications, information and resources they need for learning such as NCVPS and Learn and Earn on line. Since they are connecting to a commodity internet, the signal travels through various connections depending upon the service provider increasing problems with latency delays, interrupted service and security.



This chart shows how the traffic will flow once schools are connected to NCREN. It will eliminate interruptions of quality, reliability of service and provide increased security.



PK-20 Network

The single statewide education network provides greater potential for sharing resources across all of education and increased professional development and learning opportunities. It also creates the capacity for Universities, Colleges and Community Colleges to interact in real time with each other and public schools, better use of resources, and elimination of duplication just to mention a few possibilities. While it was the original goal of this report to address the public schools, it is vitally important to note that the Universities, Colleges and Community Colleges also stand to benefit from the further development of a statewide network. Our students in North Carolina will benefit from a K20 backbone. There should be a sense of urgency toward connecting all levels of public education in the state to NCREN. Therefore one of the 2007 recommendations in the Joint Report included charging the Education Cabinet to implement the March 2006 E-Learning Commission Phase II report. The Education Cabinet is chaired by the Governor and has the responsibility to coordinate initiatives or issues that affect all of education. The March 2006 E-Learning Report includes recommendations for creating the seamless transfer of learning from PreK-12 throughout life. This effort is currently underway as it is required in the North Carolina House Bill 1473 codified in July 2007 for the Education Cabinet to develop a plan that coordinates e-learning for PK-20.

This seamless K20 connectivity strategy for North Carolina will not only reflect the closer coupling and collaboration between the three levels of public education in the State but will also drive efficiencies to ensure that the investment of state funds are utilized to drive maximum leverage. Already examples of leveraging the state's investment are occurring:

1) Pending official designation of NCREN as the K20 backbone, the MCNC board has approved an MCNC scaling plan that partially leverages the MCNC endowment to upgrade NCREN. MCNC will invest over $7.5 million in this upgrade.
2) Statewide licenses for applications and platforms for Web 2.0 technologies like web conferencing and video streaming are being discussed. These licenses are currently procured on a school by school basis but connectivity to a common backbone will allow them to be leveraged on a statewide basis.

Conclusion

Getting the public schools connected to a statewide network where resources, services and learning options are available will level the playing field and eliminate barriers caused by zip codes. As noted in this report connectivity is just one element and will not solve the challenge the schools face with getting all students prepared for higher education and a global economy. The state still needs to continue to invest in developing the content necessary so that students are learning and teachers are teaching 21st century skills. Students and teachers also need to be provided with successful models, the necessary technology tools, and ongoing support to take advantage of options provided through connectivity as explained in elements 2 and 3. Each of these four elements presented are needed. One in isolation of the other will have a negative impact on making the transition from an industrialized education system to a knowledge based system.

While we are working on our public schools, we need to remember the initial statement about *The World is Flat* and tough business realities triggered by strong competition from India, China and other formerly second tier economies. Many of these countries have invested in connectivity and are moving ahead of the United States. Their investment is paying off and has provided them opportunities not just in their schools but also in their communities. Students don't just learn from 8-3:00, and technology has given them, their families and all citizens access to learning 24/7 if they have that opportunity at home and in their communities. North Carolina needs to continue investing in its public schools, universities and community colleges, however thought and planning needs to be given to providing access to all access in all homes and the greater community.

Attachment 1

Skills for a Globally Competitive Workforce

The North Carolina Business Committee for Education (NCBCE) conducted a survey of its members in January 2006 to determine the most important skills or qualities a high school graduate needs to succeed in the 21st century workplace. The results found that the top five (5) choices fall into two classes of skills: fundamental or core skills and sound personal values.

The fundamental or core skills cited most include:

- Applying basic mathematical concepts and skills
- Reading and comprehending materials of varying complexity, and
- Using and integrating information and communications technology

The sound personal values cited most include:

- Conducting oneself appropriately in line with social responsibility and sound ethics, and
- Working effectively as a member of a team

The results of the NCBCE survey are consistent with the national survey conducted during April and May 2006 by The Conference Board, Corporate Voices for Working Families, the Partnership for 21st Century Skills, and the Society for Human Resource Management. Its objective was to examine employers' views on the readiness of new entrants to the U.S. workforce — recently hired graduates from high schools, two-year colleges or technical schools, and four-year colleges. The four participating organizations jointly surveyed over 400 employers across the United States. These employers articulate the skill sets that new entrants—recently hired graduates from high school, two-year colleges or technical schools, and four-year colleges—need to succeed in the workplace. Among the most important skills cited by employers:

• Professionalism/work ethic
• Oral and written communications
• Teamwork/collaboration and
• Critical thinking/problem solving

These are applied skills and refer to those skills that enable new entrants to use the basic knowledge acquired in school to perform in the workplace. In order to be able to use the applied skills effectively, workers must have a command of the basic knowledge (core skills) as noted in the chart below.

Basic Knowledge/Skills	Applied Skills
• English language (spoken) • Reading comprehension (in English) • Writing in English (grammar, spelling, etc.) • Mathematics • Science • Government/economics • Humanities/arts • Foreign languages • History/Geography	• Critical thinking/problem solving • Oral communications • Written communications • Teamwork/collaboration • Diversity • Information technology application • Leadership • Creativity/innovation • Lifelong learning/self direction • Professionalism/work ethic • Ethics/social Responsibility

Nearly three-quarters of survey participants (70 percent) cite deficiencies among incoming high school graduates in "applied" skills, such as professionalism and work ethic, defined as "demonstrating personal accountability, effective work habits, e.g. punctuality, working productively with others, time and workload management."

More than 40 percent of surveyed employers say incoming high school graduates hired are deficiently prepared for the entry-level jobs they fill. The report finds that recent high school graduates lack the basic skills in reading comprehension, writing and math, which many respondents say were needed for successful job performance.

Furthermore, when asked how their hiring practices will change:

- 28 percent of employers project that their companies will reduce hiring of new entrants with only a high school diploma over the next five years.
- 49.5 percent said the percentages of two-year college graduates they hire would increase.
- 60 percent said their hires of four-year college graduates would increase.
- 42 percent said their hires of post-graduates would increase over the next five years.

The findings of both the NCBCE and the Conference Board make it clear that today's students need to be critical thinkers, problem solvers and effective communicators who are proficient in new, 21st century content areas such as global awareness and financial and civic literacy. Businesses understand that the access to core curriculum and supplemental content that is enabled by information and communications technology is essential in helping students develop the requisite skills for the work force and higher education. Using technology to enhance

learning equips students with the skills to take advantage of and thrive in the technology-intensive future of the 21st century.

Businesses also understand that a superior network with reliability, security, scalability and massive bandwidth is critical to the success of both business and education. The network provides a platform that "connects" multiple populations and enriches their experiences by providing a mechanism for communicating with each other, enhances opportunities for problem solving, creativity and teambuilding. More importantly, it provides access to information, learning options and eliminates the "zip code" limitations experienced by many students today and replaces it with a "planet code" that connects Rocky Mount with Russia as easily as it does with Roanoke Rapids.

Attachment 2

Middle School Literacy Coach Job Description

The Middle School Literacy Coach is a member of the school faculty who works with the elected School Improvement Team to develop a Literacy Improvement Action Plan. The responsibilities of the literacy coach include literacy assessment, conducting professional development in literacy teaching strategies, modeling effective classroom instruction, and observing and providing feedback to teachers. The coach has proven excellence as a classroom teacher and exemplary skills in developing, implementing, and assessing the impact of instructional strategies to improve academic literacy, overall achievement in core content areas, problem-solving skills, and use of current technology. A broad knowledge of Middle School content in all core instructional areas is necessary. Coaches use the instructional research and strategies that they learn with teacher colleagues in their schools, and must coach them in their successful implementation of the strategies in their classrooms.

Middle School Literacy Coach Skills

Skillful Collaborators

- Working with the school's literacy team, coaches determine the school's strengths in the area of literacy
- Literacy coaches promote productive relationships with and among school staff.
- Literacy coaches strengthen their professional teaching knowledge, skills, and strategies.

Skillful Job Embedded Coaches

- Literacy coaches work with teachers to provide support on reading, writing, and communication strategies.
- Literacy coaches observe and provide feedback to teachers on instruction related to literacy development.

Skillful Evaluators of Literacy Needs

- Literacy coaches lead faculty in the selection and use of a range of assessment tools as a means of making sound decisions.
- Literacy coaches conduct regular meetings with content area teachers to monitor progress.

Skillful Instructional Strategists

- Literacy coaches are familiar with the content areas and know how reading and writing processes intersect with the disciplines
- Literacy coaches demonstrate multiple comprehension strategies to assist content area teachers in developing active and competent readers

Skillful Instructional Technology Facilitators

- Literacy coaches are competent users of instructional technology and share ways to integrate technology into literacy instruction with their faculty

- Literacy coaches are effective evaluators of instructional resources

Skillful Differentiators of Instruction

- Literacy coaches are familiar with current brain research about how adolescents learn
- Literacy coaches demonstrate an understanding of a variety of ways to differentiate instruction and share those skills with teachers.

Skillful Users of Data Sources to Drive Instructional Decisions

- Literacy coaches are able to access data from a variety of sources and use that data in order to help teachers make effective instructional decisions.

Attachment 3

Technology Facilitator Job Description

Research tells us that teachers will use technology more readily and more effectively if they have the proper support. (NEED CITATION) This support includes not only an individual with the skills to keep the various technologies up and running—the technician—but also another teacher who understands and can teach others how these technologies can be used in the instructional process—the technology facilitator (or 21st Century coach). These individuals join a school's library media coordinator to form a 21st Century learning team that supports teachers and students as they teach and learn with technology.

What are the roles of the technology facilitator and technician? As stated above, technicians keep a school's equipment in good working order. They troubleshoot the network, repair equipment, install new machines and software, and just generally keep all the technologies running. When everything is going smoothly, technicians can be seen throughout the school interacting with teachers and students as part of the 21st Century learning team, facilitating a student tech help team, helping older students complete a PowerPoint project in the computer lab, or advising students as they produce the morning news show.

While technology facilitators are certainly able to make typical equipment repairs, this is not their primary responsibility. Instead, the technicians' presence allows technology facilitators to spend a majority of their time working with teachers and students. The final IMPACT research has determined that the most successful technology facilitators spend more time modeling best practices for teachers and working with students and less time on administrative duties.

The technology facilitator's job description, approved by the State Board of Education in (DATE), describes a technology facilitator's primary functions as

- Planning and facilitating teaching and learning
- Planning and facilitating information access and delivery
- Planning and facilitating program administration

It is important to note the phrase "planning and facilitating" in each of the functions. Similar to their school library media coordinator counterparts' function wording, it describes the critical role that the 21st Century learning team plays in the instructional process.

The following specific practices within the technology facilitators' job description amplify their responsibilities:

Planning and facilitating teaching and learning

1.1 Collaborates with teachers and other instructional staff to develop curriculum materials and specific lesson plans that integrate technology.
1.2 Models the integration of technology in all curriculum areas.

1.3 Facilitates school participation in technology programs and activities.
1.4 Conducts staff development in the areas of technology integration, the North Carolina Computer/Technology Skills Curriculum, and the North Carolina Technology Competencies for Educators.
1.5 Collaborates with the school library media coordinator to provide leadership in the school's use of instructional technology resources to enhance learning.
1.6 Follows a plan for professional development and actively seeks out opportunities to grow professionally.

Planning and facilitating information access and delivery

2.1 Implements best practices related to technology use in the school program based on research, pilot programs, and state/national standards.
2.2 Works with the principal and school leadership team to provide access to technology resources and services of the technology facilitator at point of need.
2.3 Works with teachers and technology staff in the selection of resources that are compatible with the school technology infrastructure.
2.4 Assists with planning the design of the technology infrastructure so that information resources are continually available to the school community.
2.5 Promotes family, business, and community partnerships that support the academic success, career readiness, and general well-being of all children.
2.6 Adheres to and communicates copyright as well as other laws and guidelines pertaining to the distribution and ethical use of all resources.
2.7 Assists in maintaining hardware, software, and network infrastructure.
2.8 Serves as the school contact for addressing hardware and software issues.

Planning and facilitating program administration

3.1 Leads, in partnership with the School Library Media Coordinator, the Media and Technology Advisory Committee in effective decision making to promote the media and technology program.
3.2 Provides leadership and collaborates with the Media and Technology Advisory Committee to develop, implement, and update a school instructional technology plan aligned with the system-level technology plan.
3.3 Collaborates with teachers, media and technology staff, and students to evaluate and select resources addressing curricular needs and learning goals.
3.4 Plays a leading role in the school's budgetary process to ensure funding for the instructional technology program to support school-wide goals.
3.5 Leads in the ongoing evaluation of the effectiveness of the instructional technology program.
3.6 Prepares and submits accurate reports as required.
3.7 Carries out non-instructional duties as assigned and/or as needed to ensure student safety.

The key to the support that the building-level 21st Century learning team offers teachers is the professional development so important in the effective use of

technology in the school and classroom. This professional development takes many forms:

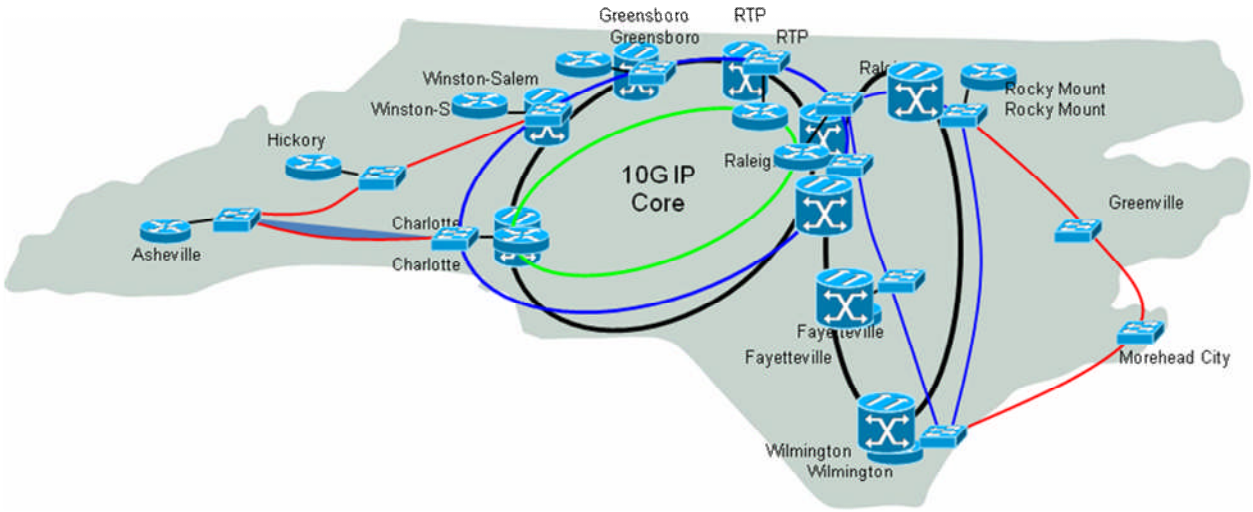
- One-to-one, just-in-time training when teachers (or students!) need to learn new skills or how to use a new piece of equipment.
- Modeling the use of technologies within the classroom for teachers so that they might gain the comfort level necessary to use it independently.
- Conducting large group training or workshops.
- Collaborating with the school library media coordinator and classroom teachers to create lessons or units of instruction.

The collaboration process, a continuous professional development experience for all involved, is critical to 21st Century teaching and learning, and technology facilitators are major players within these planning meetings. Through the collaborative planning process, teachers are able to brainstorm with other teachers, the school library media coordinator, and the technology facilitator, finding new ways of presenting information, broadening the number and kinds of resources they can bring to the lesson or unit, and making sure each child's learning style has activities and resources to address it. Again, IMPACT research and focus group conversations with classroom teachers indicate that the collaborative planning process is key to technology integration based on curriculum and student data, not as stand-alone, isolated applications.

When the media coordinator and technology facilitator are brought into the team as instructional partners, each can work with small groups of students, thus freeing up classroom teachers to teach their own small groups of students. Class size has been reduced and students have the opportunity to have individual needs addressed several times throughout the school day or week.

Attachment 4

NCREN Post MCNC Scaling Plan…



• Central and Eastern Core is delivered over owned DWDM Infrastructure

Legislative Exert from 2007-09

The following legislative information is from House Bill 1473 as enacted in Session Law 2007-323 SL2007-0323 and from the Continuation, Expansion, and Capital Budgets report for House Bill 1473 enacted on July 31, 2007.

1. School Connectivity

07 **08**

R $12,000,000 **R** $12,000,000

Provides funding to support partial implementation of a new plan for State-funded and supported IT infrastructure in the LEAs. Part of effort to increase schools' abilities to use up-to-date instructional technology.

SCHOOL CONNECTIVITY INITIATIVE

SECTION 7.28.(a) Funds are appropriated in this act to support the enhancement of the technology infrastructure for public schools. These funds shall be used for broadband access, equipment, and support services that create, improve, and sustain equity of access for instructional opportunities for public school students and educators.

SECTION 7.28.(b) As recommended in the Joint Report on Information Technology, February 2007, the State Board of Education shall contract with an entity that has the capacity of serving as the administrator of the School Connectivity Initiative and has demonstrated success in providing network services to education institutions within the State. The funds appropriated in this act shall be used to implement a plan approved by the State Board of Education to enhance the technology infrastructure for public schools that supports teaching and learning in the classrooms. The plan shall include the following components:

(1) A business plan with time lines, clearly defined outcomes, and an operational model including a governance structure, personnel, e-Rate reimbursement, support services to local school administrative units and schools, and a budget;

(2) Assurances for a fair and open bidding and contracting process;

(3) Technology assessment site survey template;

(4) Documentation of technology assessments;

(5) Documentation of how the technology will be used to enhance teaching and learning;

(6) Documentation of how existing State-invested funds for technology are maximized to implement the School Connectivity Initiative; and

(7) The number, location, and schedule of sites to be served in 2007-08 and 2008-07.

(8) Assurances that local school administrative units will upgrade internal networks in schools, provide technology tools, and support for teachers and students to use technology to improve teaching and learning.

SECTION 7.28.(c) Funds currently used for the services covered by these new funds shall not be supplanted by this additional funding and shall be used to support instructional technologies and local infrastructure in schools in support of acquisition and delivery of instructional technology resources to the classroom. Any refunds received for services paid with these technology funds shall return to the originating technology fund.

SECTION 7.28.(d) The State Board of Education shall report January 15, 2008, on its progress towards achieving the connectivity initiative and annually thereafter to the Joint Legislative Oversight Committee on Information Technology, the Joint Legislative Education Oversight Committee, the Office of State Budget and Management, the State Information Technology Officer, and the Fiscal Research Division.

SECTION 7.28.(e) As recommended in the E-Learning Report, February 2006, the Education Cabinet shall develop a plan to:

(1) Coordinate E-learning activities across the public and private universities and colleges, the community colleges, and the public schools;

(2) Establish a clear purpose and goals for the NCVirtual based on stakeholder needs and requirements;

(3) Develop a strategic plan with measurable goals with reports provided to the Education Cabinet;

(4) Develop, track, and report regularly to the Education Cabinet on appropriate accountability measures for those goals;

(5) Develop and manage an E-learning portal for the NCVirtual; and

(6) Use State-invested funds for E-learning to eliminate duplication of service.

SECTION 7.28.(f) Up to three hundred thousand dollars ($300,000) may be transferred to the Office of the Governor to establish NCVirtual (NCV) within the Education Cabinet. These funds may be used for services to coordinate E-learning activities across all State educational agencies.

SECTION 7.28.(g) The Education Cabinet shall report on its progress towards developing the plan on January 1, 2008, and annually thereafter to the Joint Legislative Oversight Committee on Information Technology, the Joint Legislative Education Oversight Committee, the Office of State Budget and Management, the State Information Technology Officer, and the Fiscal Research Division.

SECTION 7.28.(h) The State Board of Education may use up to one million dollars ($1,000,000) to establish up to eight regional positions or contract for services regionally to assist local school administrative units in implementing the Initiative. Specifically, these positions and/or contractors will assist with assessment of needs, upgrading, and planning for management of resources and ongoing maintenance. The report required under subsection (d) of this section shall include a description of each position, its salary or contract amount, and its duties.

2. NORTH CAROLINA VIRTUAL PUBLIC SCHOOL

SECTION 7.20.(a) The North Carolina Virtual Public School (NCVPS) program shall report to the State Board of Education and shall maintain an administrative office at the Department of Public Instruction.

SECTION 7.20.(b) The Director of NCVPS shall continue to ensure that course quality standards are established and met and that all e-learning opportunities offered by State-funded entities to public school students are consolidated under the North Carolina Virtual Public School program, eliminating course duplication.

SECTION 7.20.(c) Subsequent to course consolidation, the Director shall prioritize e-learning course offerings for students residing in rural and low-wealth county LEAs, in order to expand available instructional opportunities. First-available e-learning instructional opportunities should include courses required as part of the standard course of study for high school graduation and AP offerings not otherwise available.

SECTION 7.20.(d) The State Board of Education shall implement an allotment formula developed pursuant to Section 7.16(d) of S.L. 2006-66, for funding e-learning, effective in the 2008-2009 fiscal year. NCVPS shall be available at no cost to all students in North Carolina who are enrolled in North Carolina's public schools, Department of Defense schools, and schools operated by the Bureau of Indian Affairs. The Department of Public Instruction shall communicate to local school administrative units all applicable guidelines regarding the enrollment of nonpublic school students in these courses.

SECTION 7.20.(f) The State Board of Education may convert the 22 three-month positions that were authorized for NCVPS in S.L. 2006-66 to five full-time positions if the Board determines that it is appropriate to do so.

Learn & Earn Online

07	**08**
R $6,500.000	**R**$10,100,000
NR $5,000,000	

Provides funding t o support t he delivery of online college credit courses that will be made available to high school students. The non-recurring funds are appropriated to a reserve, and will not revert if they are unused in 2007- 08.

LEARN AND EARN ONLINE

SECTION 7.27.(a) Funds are appropriated in this act for the Learn and Earn Online program. This program will allow high school students to enroll in college courses to qualify for college credit. Online courses will be made available to students through The University of North Carolina and the North Carolina Community College System.

SECTION 7.27.(b) Funds shall be used for course tuition and only those technology and course fees and textbooks required for course participation. Funds shall also support a liaison position to be housed at the Department of Public Instruction to coordinate with The University of North Carolina and the North Carolina Community College System, and to communicate course availability and related information to high school administrators, teachers, and counselors.

SECTION 7.27.(c) The State Board of Education shall determine the allocation of Learn and Earn Online course offerings across the State.

SECTION 7.27.(d) The State Board of Education shall allot funds for tuition, fees, and textbooks on the basis of, and after verification of, the credit hour enrollment of high school students in Learn and Earn Online courses. Community college student enrollments in Learn and Earn Online shall not be considered as a regular budget full-time equivalent (FTE) in the curriculum enrollment formula, but shall be accounted for separately and funds shall be allotted as a special allotment.

SECTION 7.27.(e) The University of North Carolina program shall report to The University of North Carolina Board of Governors, and the North Carolina Community College program shall report to the North Carolina Community College Board of Trustees. The Department of Public Instruction shall report to the State Board of Education.

SECTION 7.27.(f) Both The University of North Carolina and the North Carolina Community College System shall provide oversight and coordination, including coordination with the Department of Public Instruction and with the North Carolina Virtual Public School (NCVPS) to avoid course duplication.

SECTION 7.27.(g) Course quality and rigor standards shall be established, and each program shall conduct course evaluations to ensure that the online courses made available to students meet the established standards.

SECTION 7.27.(h) The State Board of Education, The University of North Carolina, and the North Carolina Community College System shall report to the Joint Legislative Education Oversight Committee, the Office of State Budget and Management, and the Fiscal Research Division no later than April 15, 2008, on the implementation of the program for the 2007-2008 school year and the proposed operating plan for the 2008-2009 school year. The report shall include the number of students enrolled in courses under the Learn and Earn Online program and the number of students who completed courses during the fall semester of the 2007-2008 school year.

SECTION 7.27.(i) Local school administrative units may purchase textbooks for Learn and Earn Online courses through the Department of Public Instruction's textbook warehouse in the same manner as textbooks that have been adopted for public school students by the State Board of Education.

SECTION 7.27.(j) Chapter 115D of the General Statutes is amended by adding a new section to read:

115D-1.2. Learn and Earn Online program.

(a) Notwithstanding 115D-1, a public school student enrolled in grades 9, 10, 11, or 12 and participating in the Learn and Earn Online program shall be permitted to enroll in online courses through a community college for college credit. Students participating in the Learn and Earn Online program may enroll in Learn and Earn Online courses regardless of the college service areas in which they reside.

(b) The State Board of Community Colleges, in consultation with the Department of Public Instruction, shall adopt rules to implement this section beginning with the 2007-2008 school year."

3. School Technology Pilot

07 08

NR $3,000,000

Provides funds to be used along with a grant from the Golden LEAF Foundation and private sector funds to establish 8 pilot high schools that will incorporate technology in the classroom by providing computers for all teachers and students in the pilot schools. Non-State funds will be used to purchase student and teacher portable computers. State funds will be used to f und a program evaluation, improve network connectivity at each of the pilot sites, assist with professional development for teachers and principals, provide technical support staff, and purchase any additional software, hardware, or other equipment necessary to support the program. Any unused funds at the end of the 2007- 08 fiscal year will not revert.

FUNDS FOR SCHOOL TECHNOLOGY PILOT

SECTION 7.39.(a) Funds are appropriated in this act to the State Board of Education to be used with a grant of three million dollars ($3,000,000) from the Golden LEAF Foundation and other private sector funds to establish a school technology pilot program. Eight pilot high schools selected by the Golden LEAF Foundation and the Department of Public Instruction shall receive funds to incorporate technology in the classroom. Non-State monies shall fund student and teacher portable computers. The

State Board of Education shall report to the Joint Legislative Education Oversight Committee, the Office of State Budget and Management, and the Fiscal Research Division on the results of this pilot program by March 15, 2009. Up to one hundred thousand dollars ($100,000) may be used to contract with an independent research organization to study the effectiveness of this pilot program on student achievement, to complete a cost-benefit analysis, to make recommendations for improvements in the program, and to make recommendations regarding the possible continuance or expansion of the program. The remaining State funds shall be used to:

(1) Assess the network capabilities and connectivity needs at each of the Purchase the additional software, hardware, and other equipment necessary to support this program;

(3) Allow each pilot site to use a maximum of one hundred thirty thousand dollars ($130,000) to establish up to two positions to provide on-site instructional and technical support on a contract basis; and

(4) Provide ongoing professional development to teachers and principals in the pilot schools.

SECTION 7.39.(b) Unused funds at the end of the 2007-2008 fiscal year for this program shall not revert.

4. Literacy Coaches

07 **08**

R $5,704,400 **R**$5,704,400

Provides funds to support 100 school-based literacy coaches to be placed in 100 schools that contain an eighth grade. Coaches will provide research- based teaching practices and job-embedded professional development to assist teachers in the development of specialized curricula.

21ST CENTURY LITERACY COACHES

SECTION 7.23.(a) Funds are appropriated in this act to support the selection and hiring of new literacy coaches for middle schools or other public schools with an eighth grade class. No more than one literacy coach shall be placed in each such school. The State Board of Education, in consultation with the North Carolina Teacher Academy, shall develop a site selection process including formal criteria. The site must receive formal approval by the State Board of Education to receive funds for this purpose. To be selected schools must:

(1) Contain an eighth grade class, and

(2) Ensure that literacy coaches will have no administrative responsibilities in the schools in which they are placed.

SECTION 7.23.(b) National Board for Professional Teaching Standards (NBPTS) certified teachers serving in these positions shall be exempt from the requirements in G.S. 115C-296.2(b)(2)d. and shall remain on the NBPTS teacher salary schedule.