Long-Range Plan for Technology 2006-2020

A Report to the 80th Legislature from the Texas Education Agency

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80th Texas Legislature
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Submitted to the
Governor,
Lieutenant Governor,
Speaker of the House, and the
80th Texas Legislature

This *Long-Range Plan for Technology, 2006-2020* may be found on the TEA website at:
http://www.tea.state.tx.us/technology/etac

State Board of Education

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December 2006

The Honorable Rick Perry, Governor of Texas
The Honorable David Dewhurst, Lieutenant Governor of Texas
The Honorable Tom Craddick, Speaker of the House of Representatives
Members of the 80th Texas Legislature

The Texas Education Code, Section 32.001, requires the State Board of Education to develop a long-range plan for technology. Texas led the nation with the first *Long-Range Plan for Technology, 1988-2000* adopted by the Board in November 1988.

Since that first plan was adopted, changes in existing technologies and the emergence of new technologies created new and different opportunities for schools. Changes in legislation created more flexibility at the district level, giving districts greater opportunities than ever before to make decisions regarding technology. An update to the first plan clearly was necessary and in 1996, the State Board of Education adopted the *Long-Range Plan for Technology, 1996-2010* and presented it to the legislature.

The State Board of Education is also charged with assuring that every student in Texas has access to high quality instructional materials that are aligned with the Texas Essential Knowledge and Skills. The textbook adoption process in Texas is widely acknowledged as among the best in the nation. It ensures students have the materials they need to cover the curriculum expectations and state accountability measures. The current system for procuring textbooks ensures equity, adequacy and strong educational quality. In recent years, publishers have provided electronic updates of their online materials. The SBOE has adopted rules to allow for expedited approval of updated content and technology features in adopted materials. In 2001, Texas issued a proclamation for instructional materials for K-12 Technology Applications with an emphasis on electronic delivery. The SBOE created a subscription-based pricing model to encourage submission of online content. In Texas schools, teachers have a variety of instructional materials in both print and electronic formats.

The passage of the No Child Left Behind Act of 2001, led to the *2002 Update to the Long-Range Plan for Technology, 1996-2010* to assure that the goals and objectives of the Texas Long-Range Plan for Technology were aligned with the federal plan in order to guarantee that the students of Texas would have access to and benefit from federally funded technology programs. As a state, we have made significant progress in meeting the goals of the current plan. However, in the ten years since the adoption of the *Long-Range Plan for Technology, 1996-2010*, many changes have occurred in education as well as in technology.

Since the start of our new millennium, innovations and improvements in information and communication technologies have developed at an increasingly rapid pace in our local communities, state, nation and across the world. As a result of the great opportunities for learning provided by innovative technologies, The U.S. Department of Education targeted new strategies and goals for all school districts in the United States in its *2004 National Educational Technology Plan*. Once again, the State Board of Education is compelled and obligated – on behalf of the students of Texas – to present to the legislature a new plan, the *Long-Range Plan for Technology, 2006-2020*.

As chair of the State Board of Education I am pleased to present to you the *Long-Range Plan for Technology, 2006-2020,* based on a two-year work-study by the Educational Technology Advisory Committee (ETAC). Members of ETAC, appointed by the Commissioner of Education, represent local, state and national expertise in educating students to not only survive but truly thrive in our 21st century society. In conducting its research ETAC included input and feedback from a full contingent of education stakeholders. The *Long-Range Plan for Technology, 2006-2020*, described in full detail on the following pages, is a comprehensive plan with one goal in mind – a first rate, world class education for every student in the state of Texas.

Respectfully Submitted,

Geraldine Miller, Chairman
State Board of Education

State Board of Education

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Texas Education Agency

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Mission of Texas Public Education
-§4.001, Texas Education Code

The mission of the public education system of this state is to ensure that all Texas children have access to a quality education that enables them to achieve their potential and fully participate now and in the future in the social, economic, and educational opportunities of our state and nation. That mission is grounded on the conviction that a general diffusion of knowledge is essential for the welfare of this state and for the preservation of the liberties and rights of citizens. It is further grounded on the conviction that a successful public education system is directly related to a strong, dedicated, and supportive family and that parental involvement in the school is essential for the maximum educational achievement of a child.

The Long-Range Plan for Technology, 2006-2020 directly supports the Mission of Texas Public Education by ensuring an engaging, relevant, and future-focused system of education for young Texas learners preparing each student for success and productivity as a lifetime learner, a world-class communicator, a competitive and creative knowledge worker, and an engaged and contributing member of the emerging global digital society.

Authorization for
The Long Range Plan for Technology

Texas Education Code—Chapter 32

Sec. 32.001. DEVELOPMENT OF LONG-RANGE PLAN.
(a) The State Board of Education shall develop a long-range plan for:
(1) acquiring and using technology in the public school system;
(2) fostering professional development related to the use of technology for educators and others associated with child development;
(3) fostering computer literacy among public school students so that by the year 2000 each high school graduate in this state has computer-related skills that meet standards adopted by the board; and
(4) identifying and, through regional education service centers, distributing information on emerging technology for use in the public schools.
(b) The State Board of Education shall update as necessary the plan developed under Subsection (a).
(c) The State Board of Education, in coordination with the Texas Higher Education Coordinating Board and other public agencies and institutions the State Board of Education considers appropriate, shall propose legislation and funding necessary to implement the plan developed under Subsection (a).
(d) In developing the plan, the State Board of Education must consider accessibility of technology to students with disabilities.

Added by Acts 1995, 74th Leg., ch. 260, Sec. 1, eff. May 30, 1995.

Table of Contents

Educational Technology Advisory Committee (ETAC) Members

Co-Chairs:

Dr. Don Knezek—CEO, International Society for Technology in Education

Ann McMullan—Executive Director, Educational Technology, Klein ISD

Members:

Shelia Brown—Principal, Northside Elementary, DeSoto ISD

David Byer—President, National Coalition for Technology in Education and Training

Lisa Chandler—Senior Director, Student Assessment, TEA

Joe Chase—Supervisor, Alternative Certification, Houston ISD

Steffanie Chew—Principal, Carver Academy Elementary, Amarillo ISD

Dr. Katherine Conoly—Executive Director of Instructional Support, Corpus Christi ISD

Anna Cruz—Distance Education Senior Field Trainer/Analyst, UT Austin

Dr. Trina Davis—Assistant Professor and Director of eEducation, Texas A&M University

Dr. Randal Douglas—Director of Educational Technology, ESC Region 11

Dr. Geoffrey Fletcher—Editor at Large, T.H.E. Journal

Hector Giron—Principal, Canutillo Elementary, Canutillo ISD

Anita Givens—Senior Director of Instructional Materials and Educational Technology, TEA

Dr. Sylvia Hatton—Executive Director, ESC Region 1

Mary Hewett—Executive Director of Instructional Technology, Plano ISD

Jim Hindes—Director of Instructional Technology, Pleasanton ISD

Eric Hough—Principal, Tom Bean Elementary School, Tom Bean ISD

Dr. Sharon Jackson—Deputy Associate Commissioner, Standards and Alignment, TEA

Harry Jones—Executive Director of Technology, Weatherford ISD

Glenn Kirchner—Test Administration Team, Student Assessment, TEA

Debbie Little—Spanish Teacher, Abbott ISD

Charles Mayo—Manager of Distribution, Accessibility and Finance, Instructional Materials and Educational Technology, TEA

Educational Technology Advisory Committee (ETAC) Members

Lisa McCray—Director of Technology for Instruction, ESC Region 12

Jan McSorley—Special Education Technology Facilitator, Austin ISD

Gilbert Maldonado—Interim Director, Development Office, UT Pan Am

Monica G. Martinez—Curriculum Director, TEA

Sharron Rush—Executive Director, Knowbility, Inc.

Lee Sleeper—Technology Director, Bullard ISD

Marilyn Suttles—Campus Technologist, Conroe ISD

Micha Villarreal—Director of Instructional Technology, Ysleta ISD

Carol Willis—Manager, Texas Education Telecommunications Network (TETN)

Pam Wood—Director of Academic Services, Angleton ISD

Instructional Materials and Educational Technology Staff Members, TEA

John Lopez—Manager, Learning Resources

Karen Kahan—Director of Technology Applications

Kate Loughrey—Director of Distance Learning

Kelly Griffin—Director of Special Projects

Terry Wyatt—Special Projects Administrator

Richard LaGow—Educational Technology Specialist

Kathy Ferguson—Distance Learning Specialist

Tammy Brite—Distance Learning Specialist

Tammy Torres—Administrative Assistant

Others:

Nancy Little—ETAC Liaison, Educational Technology Planning and Evaluation Consultant

Jeri Hodges—Consultant, Title II Part D, ESC Region 10

Trudy LeDoux—Technology Planning and E-Rate Support Center, ESC Region 12

Educational Technology Advisory Committee

Timeline of Events
2004–2005

August 2004	New Educational Technology Advisory Committee (ETAC) established.
September 2004	Commissioner appointed ETAC members.
October 2004	October 13-14 ETAC Meeting in Austin—Charge to committee; scheduled meetings; selected workgroups; began discussion of planning process; workgroups reviewed four sections of current plan and recommended changes.
November 2004	November 30 ETAC TETN Meeting—Subgroups continued work on recommendations.
January 2005	January 18-19 ETAC Meeting in Austin—Reviewed and discussed National Educational Technology Plan, Sunset recommendations, and proposed legislation. Reviewed subgroup work on current plan recommendations.
February 2005	February 24 ETAC TETN Meeting—Reports on subgroup work.
April 2005	April 26-27 ETAC Meeting in Austin—Developed vision for 2020. Completed crosswalk of recommendations for all four sections of the plan. Considered impact of vision, pending legislation, and crosswalk results.
May 2005	Discussed plan at Technology Coordinators Special Interest Group (TEC-SIG) meeting.
July 2005	Updated State Board of Education (SBOE) on ETAC work.
August 2005	Recommended new members to fill vacancies on ETAC.
September 2005	Commissioner appointed new members.
October 2005	October 4-5 ETAC Meeting in Austin—Oriented new members on work to date; reviewed data from Campus and Teacher STaR Charts for 2004-2005 school year; developed recommendations beyond 2010.
November 2005	Updated SBOE on progress. Continued research to guide plan recommendations; shared results with ETAC members.

Educational Technology Advisory Committee

Timeline of Events
2006–2007

January 2006	January 17-18 ETAC Meeting in Austin. Discussed draft of introduction and recommendations. Made plans and assignments for feedback session at Texas Computer Education Association (TCEA).
February 2006	Convened focus groups at the Texas Computer Education Association (TCEA) Conference to gain input on the plan.
March 2006	March 28-29 ETAC Meeting in Austin—Reviewed input from focus groups; finalized sections of plan. Prepared draft of new plan.
April 2006	Updated SBOE on progress. Posted draft plan on the TEA website for 30-day public comment period.
May 2006	May 11-12 Discussed plan at Technology Coordinators Special Interest Group (TEC-SIG) of the Texas Computer Education Association (TCEA)
June 2006	ETAC meetings in Austin
July 2006	Updated SBOE on progress.
August 2006	Two-year term expired for some ETAC members. Recommended members for 2006-2008. Printed draft of plan.
September 2006	Commissioner appointed ETAC members. Presented final draft of the new plan to SBOE.
October 2006	ETAC Meeting in Austin.
November 2006	Presented plan to SBOE for adoption.
December 2006	Submitted new plan to the 80th Texas Legislature.
January 2007	Showcase plan at TASA/TASB Midwinter Conference. Distribute plan to all schools. Submit new plan to the U.S. Department of Education.
February 2007	Present plan at TCEA state conference.
March 2007	District technology plan updates due in Texas ePlan by March 31st.
April 2007	Monitor proposed legislation for impact on implementation of the new plan.
May 2007	Discuss implementation strategies and planning tools at TEC-SIG.
June 2007	Present new plan at the National Educational Computing Conference (NECC)

Teaching and Learning

Educator Preparation and Development

Leadership, Administration And Instructional Support

Infrastructure for Technology

Vision
2020

ADDRESSING THE NEEDS OF EDUCATION IN TEXAS
AND PLANTING THE SEEDS FOR A SECURE FUTURE

Imagine an education system where......

Students can expect higher performance and deeper engagement in academic, real world endeavors by accessing digital tools and resources available twenty-four hours a day, seven days a week (24/7) appropriate to individual strengths, needs, and learning styles. Students know they will be prepared to thrive in a global workforce with changing economic implications.

Parents can expect not only to participate more directly in their children's education but also to improve their own knowledge as parents and citizens. Communications increase as parents have 24/7 access to learning resources and student information such as achievement, attendance, and discipline.

Educators can expect to access and use student information on demand in order to individualize instruction. The use of digital tools and resources and 24/7 professional development opportunities transform the educators' role in the educational process. Increased communication will enhance collaboration between school, home, and community.

Community and school board members can expect more effective and efficient use of fiscal resources and human capital. Increased communication and participation in the educational decision-making process is enhanced through the use of anytime, anywhere digital tools and resources.

In order to have this educational system, Texas must consider extending the traditional boundaries of the school year, scholastic age, and geographic location, and the state must provide both the technology and human infrastructure to facilitate, support and maintain this transformation. With the convergence of a variety of technologies, this vision is possible in more ways than once imagined. The teaching and learning process must be receptive to a wide variety of options, including expansion of learning extended into the home and into the broader community, development of virtual relationships among learners, and learning through online and other distributed learning environments.

Technology Proficiencies

All professional educators (including teachers, administrators, and librarians) must master the State Board for Educator Certification (SBEC) Technology Applications standards, which are currently mandated for all beginning teachers. Teachers must first have access to technology, quality professional development, and time to implement new strategies in their classroom. These steps are essential to reaching this goal. Students beginning in kindergarten must master the state Technology Applications Texas Essential Knowledge and Skills (TEKS) and demonstrate that they are technology literate with the needed proficiencies to acquire information, solve problems, and communicate using technology.

The TEKS for all core content and enrichment areas must reflect the educational and employment needs of the 21st Century. Information and communication literacy skills must be fully integrated into core content instruction. High stakes testing must reflect the skill sets needed to function in a global, information age economy.

Professional Development

To provide a 21st Century education to students, professional development opportunities must be provided to ensure that educators have the Technology Applications skills identified by the SBEC Technology Applications Standards, especially those skills that support lesson planning, classroom management, and administrative tasks. Professional development opportunities for educators must be available 24/7 to all educators through a variety of delivery methods, including online and other distance learning technologies.

Texas has many teachers who are very comfortable with technology and use it regularly in their classrooms. Most others are willing to learn but have had limited access to technology and limited time for professional development to develop their skills and sufficient exposure to the effective use of technology. To meet the needs of Texas students and prepare them for success in the 21st Century, Texas must devote significant time and resources to the adequate preparation of and ongoing professional development for all teachers. A comprehensive professional development initiative is imperative. With sustained leadership and support, this initiative can move teachers from Early or Developing Tech on the Teacher STaR Chart to Advanced or Target Tech. This initiative should be responsive to the needs of teachers by providing content-focused strategies and technology tools appropriate for each subject area and grade level.

Technology Planning and Resources

Technology is an integral part of the planning process at all levels. Sufficient technical support to provide anytime, anywhere digital tools and resources is critical to meeting the needs of the 21st Century educational system. Budget and funding must be provided at a level that will ensure the effective implementation of the technology plan. Budgeting considerations will acknowledge total cost of ownership and sustainability requirements.

The educational system must be equipped with ample digital tools and resources for all learners. Quality, affordable, universal broadband access must be made available to all, including those with disabilities. A web portal should be provided for Texas educators, students, and parents to address the needs of individual learners. Resources provided in the portal should maximize the use of 21st Century tools for learning. Secure, accurate data must be available for decision-making at all levels. A collaborative education network connecting schools, colleges, medical facilities, libraries, businesses, and homes must support the education system of the 21st Century.

Expectations of Plan

The vision of this new plan is ambitious. Charting the course for educational technology through 2020 requires systematic planning and step-by-step strategies implemented over time to make the vision a reality. The Texas education system is built upon a commitment to excellence and equity, providing a quality education to all students. Rigorous curriculum standards, quality instructional materials, and comprehensive student assessments provide the framework for ensuring student success. Visionary school leaders and well prepared teachers build upon that framework to provide opportunities for students to reach their full potential.

To reach the goals of this Long-Range Plan for Technology, 2006-2020, strategies must be put in place that can be accomplished and measured over time. The recommendations for Teaching and Learning; Educator Preparation and Development; Leadership, Administration and Instructional Support; and infrastructure for Technology implemented together will help realize the overarching vision of the plan by 2020.

Phase I   2006-2010

> ➢ Continue to refine and align curriculum content standards to reflect current research and meet the needs of the 21st Century workplace and higher education
> ➢ Continue to provide quality instructional materials, aligned to content standards, and delivered in print and digital formats to meet the needs of all students
> ➢ Continue to align assessment instruments to content standards and measure student progress
> ➢ Provide equitable access to technology tools for students and teachers, such as student and teacher workstations, productivity tools, online resources, interactive whiteboards, projection systems, and printers
> ➢ Provide on-going quality professional development for educators to ensure proficiency in using technology tools to personalize instruction and in using data effectively to inform instructional practice
> ➢ Provide opportunities for teachers to implement new strategies for enhancing teaching an learning through the use of quality instructional resources and technology tools
> ➢ Provide adequate connectivity in schools and classrooms to ensure effective use of technology resources
> ➢ Provide necessary technical support to ensure availability and reliability of technology resources
> ➢ Increase the Technology Allotment to at least $50 per student per year and fund from the Telecommunications Infrastructure Fund

Technology planning is an on-going process that requires frequent review and revision. Strategies for Phases II and III of the plan should be developed to reflect progress in Phase I and as changes in education and technologies warrant.

Phase II   2011-2015

Phase III   2016-2020

Successful implementation of the *Texas Long Range Plan for Technology, 2006-2020* in Texas schools will result in an education system in Texas in which by 2020:

Learners

All learners engage in individualized, real-world learning experiences supported by ubiquitous access to modern digital tools; robust anywhere, anytime connectivity; and dynamic, diverse learning communities. They access, evaluate, manage, and use information in a variety of media formats from a wide array of sources, and they create knowledge, apply it across disciplines and creative endeavors, and purposefully communicate that knowledge, and the results of its use, to diverse audiences. Learning experiences take place in authentic settings and require collaboration and management of complex processes. These experiences involve critical thinking, global and local social responsibility, complex decision-making, and sophisticated problem-solving. Learners develop the self-directed learning skills and attitudes that enable them to learn effectively for a lifetime of global citizenship.

Educators

All educators, PreK-12 through higher education, are well prepared throughout their careers to use current digital tools, digital resources, and modern, effective teaching-learning processes to mentor, monitor, and motivate students. They leverage the technology and information-rich learning landscape of 2020 to provide flexible, seamless, and learner-centered environments that meet the individual and diverse needs of all students and communicate to learners and parents progress toward learning targets. They participate in communities of learning and inquiry, as co-learners and researchers, with students, colleagues, and other experts to ensure their own development and professional learning as both accomplished education professionals and content experts. All educators contribute to the education profession by informing policy, recruiting, and supporting colleagues, and they represent the profession positively within and outside of education.

Leaders

All education leaders create and secure adequate support for innovative, flexible, and responsive technology-rich environments and services to maximize learning and optimize teaching. They develop a shared vision for world-class learning in all instructional settings – face to face or virtual and for technology's role in achieving that vision. They engage in data-rich planning for and evaluation of learning and management systems that leverage resources and opportunities throughout the community and around the world. Leaders provide and demand participation in sustained, relevant, engaging, and timely professional development that enables teachers and other instructional personnel to provide leadership for learning in 2020. Education leaders provide stewardship for universal education.

Infrastructure

An industry-standard infrastructure system supports all students, educators, and education leaders by enabling high quality access to learning, communications, and management systems anytime and anywhere. It ensures access to appropriate technologies, quality and relevant information, and effective just-in-time technical support for students, educators, and other stakeholders. Interoperability, accessibility, and ongoing upgrades as needs and standards change are characteristics of the infrastructure system for learning. Education infrastructure is benchmarked against other education entities in the state and the nation and against successful and progressive commercial information-based enterprises.

DEFINING THE NEED FOR CHANGE

Across the globe, exponential growth in technology has transformed every aspect of business, government, society, and life. These transformational changes have been and will continue to be increasingly pervasive and far-reaching. Advances in technology, mathematics, and science across the globe have resulted in a global intellectual and economic race never before seen or imagined. At the turn of the 21st Century, and as a result of ubiquitous and affordable access to advanced technologies, increasingly diverse individuals and small groups of individuals not historically seen as a competitive force are able to participate in the economic structure of society. At the same time, large corporate organizations of the 20th Century are struggling with antiquated infrastructure and also struggle with securing the intellectual talent required for growth in an economy that thrives on intellectual labor.

State of Global Economics

This state and nation have moved from an industrial, manufacturing era to an information-based economy. The essential skills of this new economy are not forged in simple machines and basic literacy; instead, the essential skills required in this new era are those of agility, self-reliance, self-motivation, problem-solving, collaboration, life-long learning and facility in using information and communication technologies. In the global economies of the 21st Century, educators are connecting undiscovered knowledge pools across the globe, where intellectual work and intellectual capital can be delivered from anywhere and at any time. Technology and advanced communications have transformed the world into a global community where workplaces are constantly evolving to respond to global market expectations for products and services. Competitive businesses will require employees to acquire new knowledge, learn new technologies, rapidly process information, make decisions, and communicate in a globally diverse society.

State of Urgency

> "In 2001, India graduated almost a million more students from college than the United States did. China graduates twice as many students with bachelor's degrees as the U.S., and they have six times as many graduates majoring in engineering."
> *Source: Thomas Friedman The World Is Flat*

In order to provide Texas students with a competitive role in these emerging global economies, State leaders and educators must define the current and future challenges impeding educational and economic progress and develop a strategic educational response. The goal in teaching and learning must be to empower young citizens to live and learn in a continuously changing 21st Century environment and to enable this citizenry to effectively interact in a global marketplace. The globalization of society creates an educational challenge extending the goals of teaching and learning in the 21st Century far beyond the walls of the classroom and the confines of a traditional school schedule. It is the responsibility of this state's leadership to respond to these educational challenges by providing direction, equitable access, and resources to secure the future of the state of Texas and this nation.

State of Societal Change

Since 1900, the average life expectancy of Americans has increased 30 years. Today's American work force is living longer and retiring later, which will affect the availability of jobs. Since 2000, almost nine million legal immigrants have entered the United States with 65 percent of them settling in only six states: California, New York, Texas, Florida, New Jersey, and Illinois. In the 2004-2005 school year, there were 4.3 million students in the Texas public school system with more than 54 percent economically disadvantaged. Additionally, the racial and ethnic demographics in the 2004-2005 school year reflect the changing state: 44.7 percent were Hispanic and 14.2 percent were African American, for a total of 58.9 percent, creating a majority-minority student population.

Students by Ethnicity and Economic Status		
	Number of Students	% of total
African American	621,999	14.2%
Hispanic	1,961,549	44.7%
White	1,653,008	37.7%
Other	147,315	3.4%
Total	4,383,871	100.0%
Economic Disadvantaged	2,394,001	54.60%

2004-2005 Texas Public School Statistics
Texas Education Agency

Texas is expected to add nearly 3.8 million students in K-12 and higher education over the next 40 years with an increasingly diverse population. Texas has seen an average growth of approximately 80,000 students per year for the past several years.

Public Elementary and Secondary Schools Pupil Projections
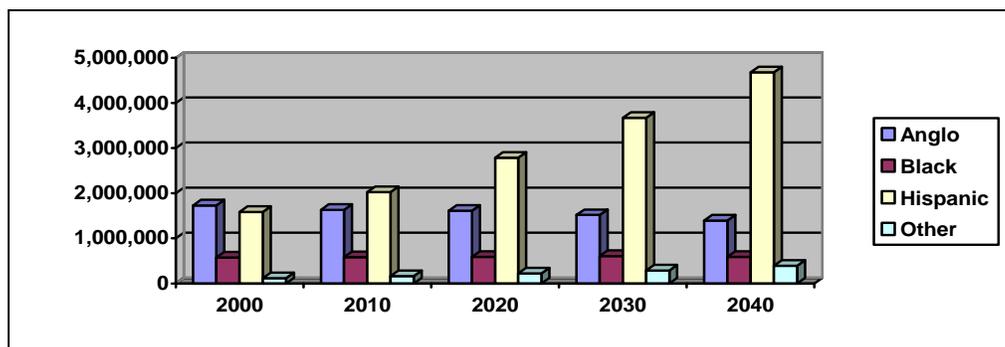
Source: Texas State Demographer

Technology has moved into the daily life of many Americans. New homes are being built with network capabilities that include telephone, data, and video drops. Technologies to bank, shop, learn, communicate, and manage a home are common. Many retail outlets offer self-checkout stands and automated payment through the use of debit cards. Bills can now be received electronically and paid online from home. Travelers have access to eTicketing and self check-in systems. All Americans belong to a nation that has become heavily reliant on technology and the rapid pace of its use in our daily lives will impact all Texans. Educational systems must consider this rapid pace of change and plan for a future that serves all citizens.

Introducing the 21st Century Learner

Today's students are technology-savvy, feel strongly about the positive value of technology, and rely upon technology as an essential and preferred component of every aspect of their lives. Today's students need access to life-changing tools that are available for their use before they walk into a school building. With different expectations, these learners require a significant, immediate shift in teaching methodology.

The 21st Century learner expects content to be relevant and presented in a way that applies to the student's individual learning style. Learning no longer can be "one-size fits all," It must be tailored to the individual and accomplished through a multitude of learning resources, digital content, and multimedia resources in a variety of learning environments.

It is essential to teach the basics in which learning skills, in addition to content, are the focus. Students require skills that allow them to communicate in a technology-enriched society. They need technical as well as traditional reading and writing skills, and they need analytical skills for accessing and applying information. Problem-solving and reasoning skills must be learned so these students become analytical thinkers in a digital age. Students expect these skills and new subject matter to be taught with engaging methodologies and digital tools.

21st Century learners assume responsibility for their personal well-being. The 21st Century learner encounters different perspectives, different cultures, and different languages when involved in global collaborative learning. These technology-savvy students will develop personal skills that include the ability to self-assess their behavior, to develop and achieve goals, and to react to situations that require an ethical response.

These learners will use portable and personal technologies and have already become constant communicators. It is likely in the future that personal devices such as cell phones and new technologies yet to be developed will be their primary means to interact with the digital world. As the technology improves at an accelerating rate, these learners will communicate, connect with digital content, collaborate with other learners, gather real-time data that include their current surroundings, and analyze data to fit their personal learning requirements. The portable devices will also provide real-time assessment of the learner's progress.

Student Voices

Today's students are different. They don't know a world without color TV, video games, cell phones, and the Internet. Outside the classroom, they are growing up in a multi-sensory, multimedia, computer-driven world which provides a clear, vivid presentation of information. Texas students are also very interested in technology inside their school. NetDay, a national education technology non-profit group, has conducted an annual online survey for the past three years. Last year, more than 193,085 students and 15,582 teachers across the country participated in *NetDay Speak Up 2005** and 59,138 students and 5,592 teachers were from Texas. Surveys were available for grades K-3, 3-6 and 6-12. Schools selected the survey according to the grades taught on their campus. This Student Voices section includes the responses to some of the questions from this comprehensive survey.

Additional data is available on the TEA website at www.tea.state.tx.us/technology/etac. The expectations and needs of students expressed through the *NetDay Speak Up 2005 survey* help to guide the use of technology in schools. Results show, from the students' perspective, how technology is being used at school and home.

Grades K-3

The K-3 survey reveals that 79% of respondents have a computer at home that they use and 85% use a computer for schoolwork. Nationally, 73% have a computer at home and 76% report that they use a computer for schoolwork. The most frequently used technology by this age group is a desktop computer (65%), with video games (63%) and hand-held games (45%) not far behind. Students indicate that using technology for school makes it more fun (61%) and they learn more (41%).
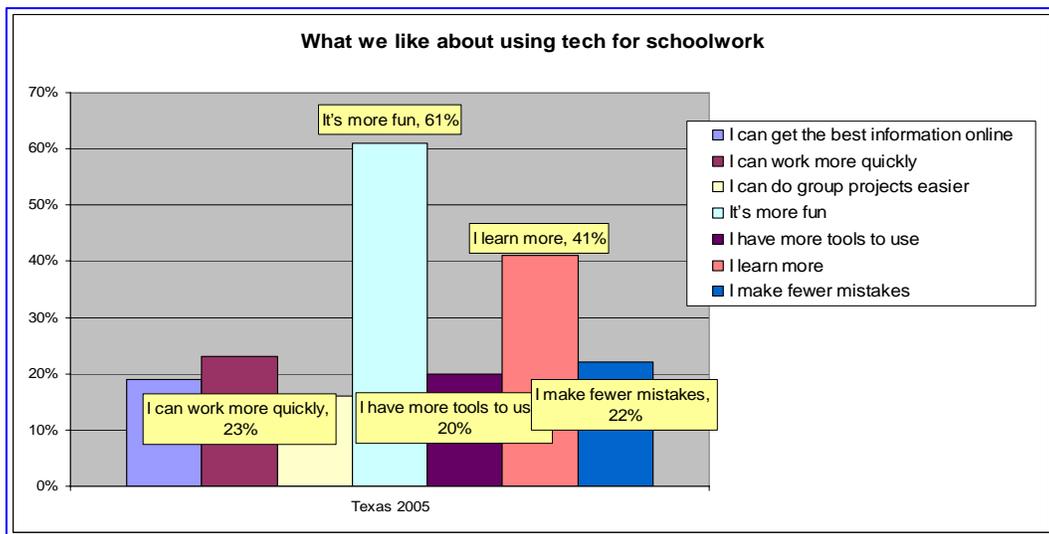
Students also indicate that many subjects would be easier to learn with technology and math tops their list.
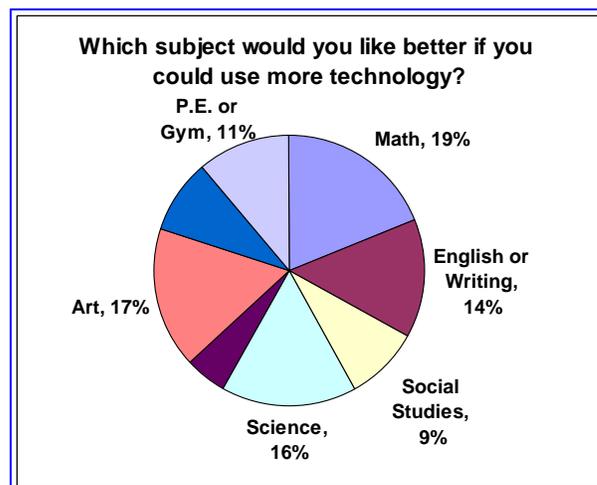
When asked about their technology skills, 50% believe they are about the same as their peers with 30% reporting that they know more and 20% indicate they know less than their peers. When designing a new school, these students prefer a laptop for every student and a new computer for every teacher.

Grades 3-6

Students in grades 3-6 also use technology on a regular basis. Desktop computers are the most frequently used at 60% and video game players are the next most frequently used at 56%. This age group also reported that 52% use a cell phone. Many in this age group use the Internet to play games online (57%), visit a favorite website (42%), and use a search engine such as Google (27%). Members of this age group reported they have technology skills that are similar to those of their peers (58%) or more advanced skills than their peers (26%). The national picture was the same.

The most frequently reported online activities for school include using the Internet and school website, creating a presentation, and taking a test online. Not enough computer time, computers that don't always work, and not enough computers were cited as the primary barriers to using technology at school. Texas data is very similar to national trends.

Tech Use: Online Activities for School
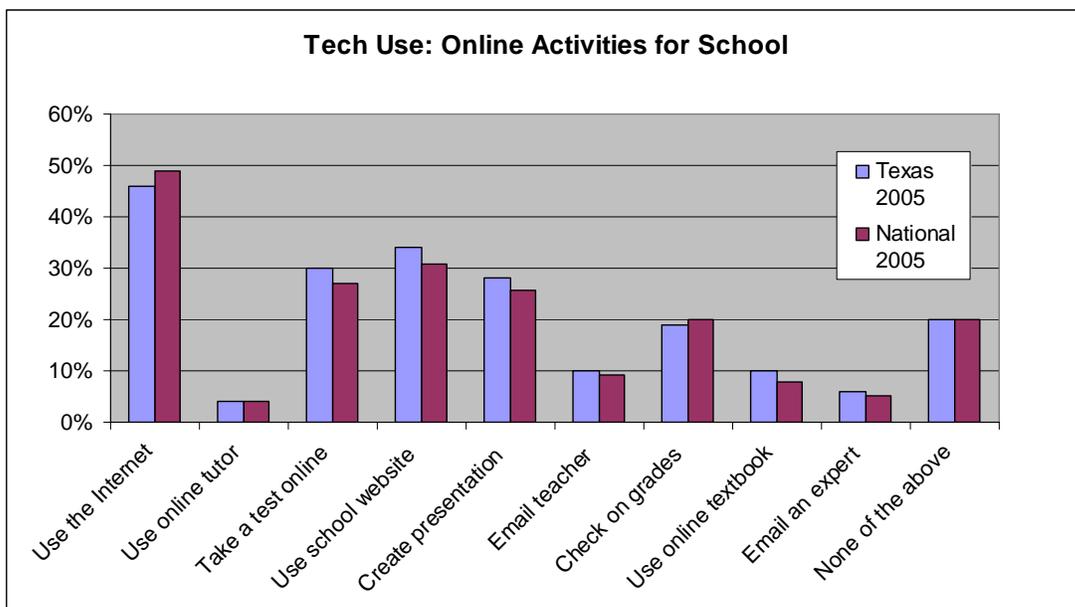
This age group also reported that learning with technology is more fun; they learn more; they can find the best information online; and they learn more quickly. Seventy percent indicated that their schools have a school website, 50% have computer classes, and 32% have laptops. Nationally, 62% have a school website; 58% have computer classes; and 31% have laptops. Math again is the top choice of subjects that students would like better if they could use more technology (29%). Science ranked second with 17%. If they could be principal for a day, 36% would provide laptops for students and 21% wanted MP3 players for school use, while 13% would provide better equipment. When asked to design a new school, 35% would provide laptops for students.

Grades 6-12

More than 30,000 Texas students in grades 6 through 12 participated in *NetDay Speak Up 2005.* When asked "In a typical week, which of these technology products do you use? (Select all that apply.)," this group reported using a wide variety of technologies. Computers are the most frequently used with desktops at 82% and laptops at 36%, followed closely by cell phones at 77% and video games at 63%. It is no surprise that these students seek greater use of technology at school as well. When asked to identify essential 21st Century classroom devices, computers were high on the list and students also included technologies such as digital cameras, smart boards, scanners, and DVD or CD burners.

Essential 21st Century Classroom Devices

Desktop computer, 69%
Laptop computer, 65%
Smart Board, 43%
Digital camera, 48%
DVD or CD burner, 47%

Legend:
- Desktop computer
- Laptop computer
- Cell phone
- Hand-held device (PDA)
- Smart Board
- Big-Screen television
- Digital camera
- Video camera
- Scanner
- DVD or CD burner
- Video game player

Texas 2005
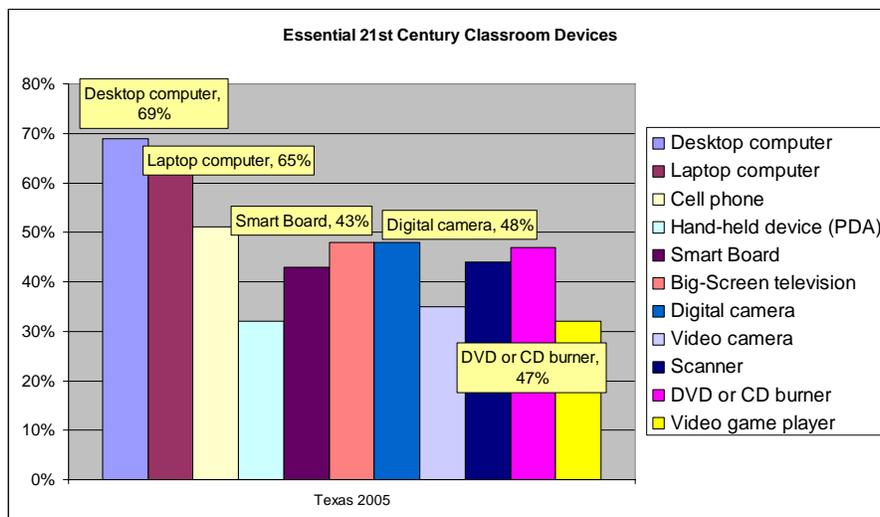
This age group in Texas also reported using Internet tools such as email, search engines, specific websites, Instant Messenger, and online game sites each week. Fifty percent indicated they have a personal website, 68% use email and 58% use Instant Messenger daily. When describing their technology skills, 67% indicated they were average, 26% advanced, and only 7% rated themselves as beginners.

Which subject would be more interesting if you could use more technology?

- Math, 21%
- English or Writing, 17%
- Social Studies, 18%
- Science, 17%
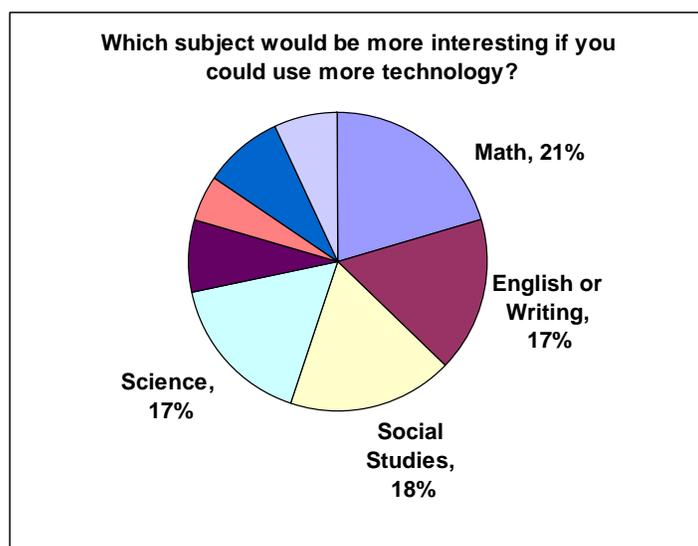
Once again, the subject selected most often as more interesting if using technology is Math. This sends a clear message that additional efforts are needed to ensure all Math teachers are well-trained to use technology effectively in this content area and maximize the interest students have in learning with technology.

What we like about using tech for schoolwork
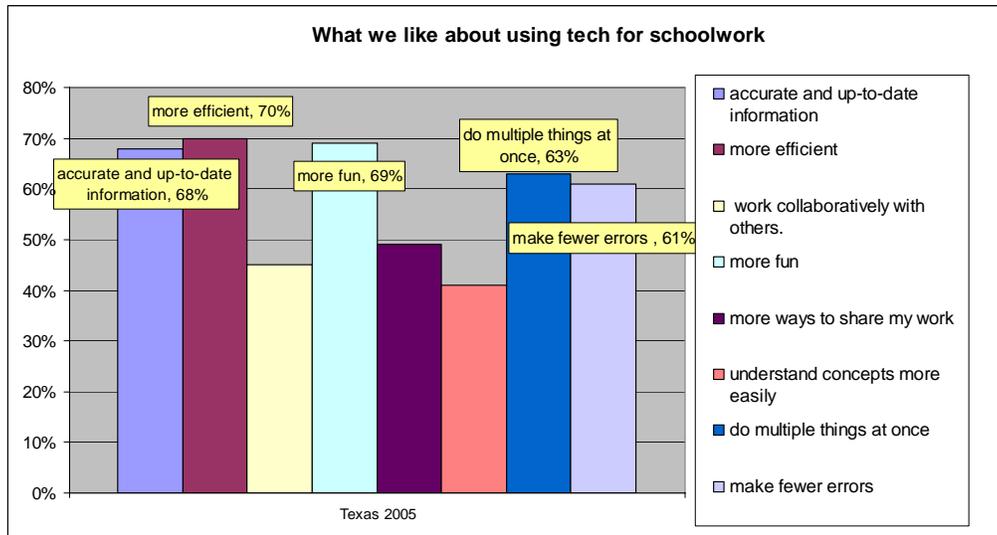
The most frequently reported online activities for school include using the Internet, creating a presentation, accessing the school website, and taking a test online. Again, Texas data is very similar to national trends.

As with other groups, students in grades 6-12 would provide laptops for students if they were the principal and they would make cell phones, email, and Instant Messenger available to students as well. Students indicated a variety of reasons for good technology skills. Doing well in school tops the list, success in college and keeping in touch with family and friends tied for second and finding a job earns the number three spot.

If they were designing a new school, students indicated that access would be their top priority. Thirty-five percent selected laptops for every student that can be taken home, 16% chose fast, wireless Internet access throughout the school, and 10% wanted computer labs that stay open after school and on weekends. Access to school computers and the school network from home; new up-to-date software, digital cameras, and video equipment that could be borrowed by any student; and a fully equipped film studio were also selected as key elements of a new school.

The results show that our students are very familiar with technology and are frequent users. Technology is an integral part of their daily lives and students expect to access and use it in school. Survey results help to visualize the importance of technology in schools and at home. There are many educational applications of the technology that support learning wherever and whenever it occurs. Overall, the importance of the Internet, especially in the upper grades is evident. The data from the survey when asked "If you were designing a new school" or "If I were principal" gives interesting information that can be valuable when planning at the school or district level. The findings from the question "Which subject would be more interesting if you could use more technology?" show the importance of using technology in math as well as in the other core curriculum areas.

Teacher Voices

More than 5,000 Texas teachers participated in *NetDay Speak Up 2005*: more than 30% of the 15,000 nationwide. The majority were classroom teachers (72%), special education teachers (6%) as well as curriculum coordinators (2%), technology coordinators (2%) library-media specialists (3%), instructional aides (5%), and administrators (3%). All grade levels were represented. A comparison to the national survey is shown below. In 2004, more Texas teachers from grades 9-12 completed the survey.

While more experienced teachers are often thought of as resistant to technology, more than 35% of those participating in this technology-related survey have 16 or more years teaching experience. More than 30% teach multiple subjects and most subject areas were represented. Texas respondents were representative of those participating nationwide.

Survey Participants - Subject Areas
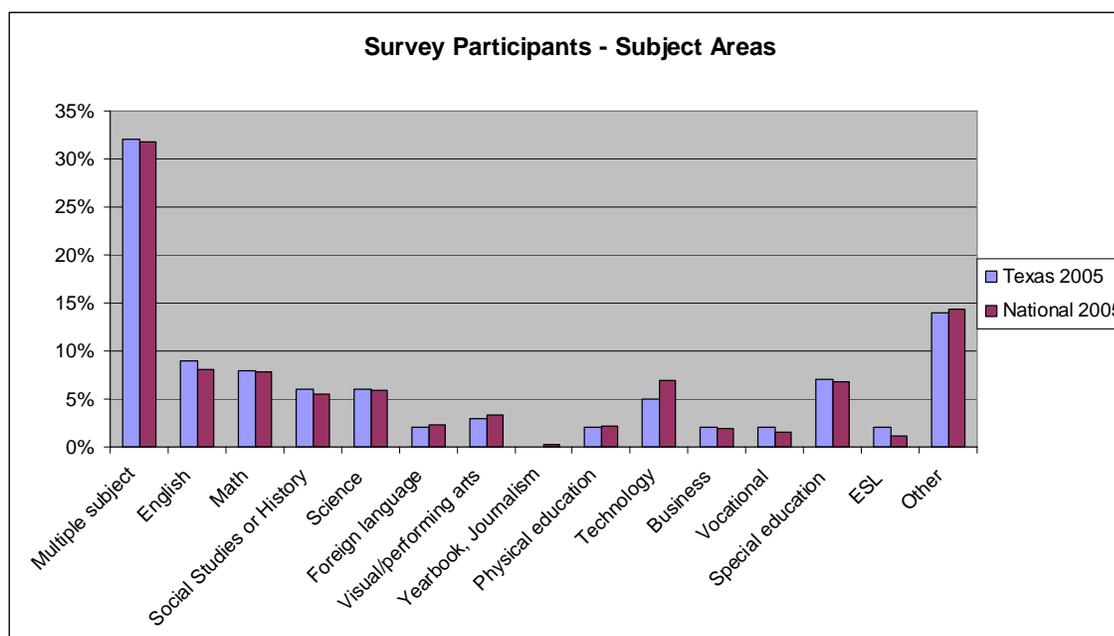
Most teachers indicated that the primary impact of technology on student performance is student engagement (57%), student achievement (46%), or collaboration and teamwork (35%). Only 12% did not see an impact of technology on student performance. All Texas teachers reported use of a variety of technology tools in the classroom, with 97% indicating they use a desktop computer and 31% have a laptop computer. Sixty-four percent use cell phones. Nationally, only 1% of teachers reported not using any technology tool.

Texas teachers also report using email (99%), specific websites (82%), search engines (82%), and news websites (36%) weekly for work. Listservs, portal sites, Instant Messenger, discussion boards, chat rooms, blogs, and podcasts were also reported by some teachers. Ninety-five percent have a computer in their classroom, 89% have a school email account, and 50% are provided tools for building websites. Teachers use email as a primary communication tool to keep in touch with other teachers, parents, administrators, students, and other professionals.

When compared with other teachers, 55% rate their technology skills as average, 35% as advanced, and only 12% consider themselves beginners. Lack of time during the school day is the primary obstacle teachers face when using technology in their classroom (59%). Lack of enough computers (46%) and no home access for students (45%), as well as not enough time for planning (44%), are additional barriers. Most teachers indicated that their pre-service preparation or school-provided professional development aided in their use of technology. All teachers reported a desire for additional professional development with the primary emphasis on integration of technology into the curriculum and instruction.

Tech Ed: Areas for Professional Development
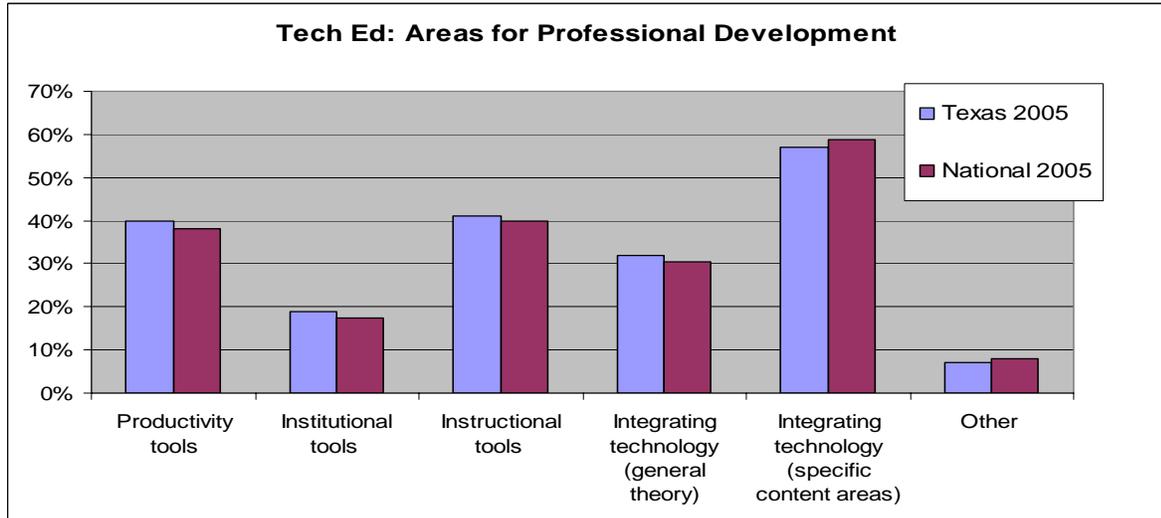
Texas teachers report that they primarily use the computer in their classroom for professional tasks such as email with colleagues or parents and accessing the Internet. Most Texas teachers have a computer at home and more than 50% have cable or DSL but only 10% indicate they do their professional tasks from home.

Location

Internet at home
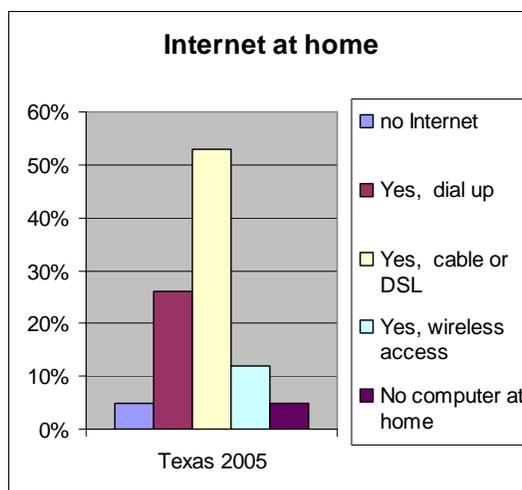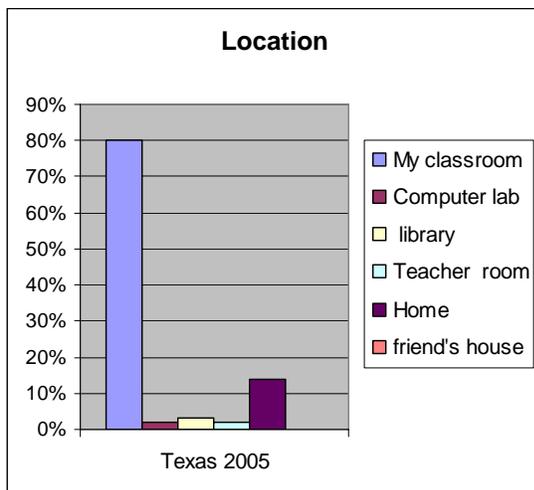
Teachers indicated that as a result of using technology:
- 76%   My job is easier.
- 51%   I communicate more with parents about their children's progress.
- 46%   Multimedia opportunities have made learning experiences richer.
- 44%   Students take a more active role in their learning.
- 43%   My lesson plans are richer because of information from the Internet.
- 42%   Students expect school to be fun, exciting, and entertaining.

When asked which technologies would have the most impact on students, teachers responded:
- 63%   Having a useful school website
- 46%   Providing laptops for students to use at school
- 42%   Offering computer-science courses

When asked to design a new school, Texas teachers identified that fast, wireless Internet access was critical along with professional development time for learning new technologies.

Designing a New School

Legend:
- Fast, wireless Internet access
- New up-to-date software
- A new computer for every teacher
- A hand-held device for every teacher
- Digital cameras and video equipment
- A teacher's computer lab
- Prof. devp. time for learning technology
- Access to the school network from home
- Technology maintenance and support
- New computers throughout the school
- A film studio
- A laptop for every student
- Other

Callouts: Fast, wireless Internet access , 18%; Prof. devp. time for learning technology, 14%; A laptop for every student, 13%

Texas 2005

Results of *NetDay Speak Up 2005* provided schools and stakeholders with data that can give a picture of the way today's teachers view and use technology in their classrooms and at home. Most teachers completing the survey (97%) use desktop computers in their classrooms. Barriers to the use of technology were lack of time, lack of enough computers, and home access for students. All teachers reported a desire for additional professional development with the primary emphasis on integration. The list of results from using technology and results from asking about the technologies that most impact students provides valuable data that can be used when planning for the use of technology in schools.

NetDay Speak Up is a national initiative of Project Tomorrow, the new nonprofit organization formed with the merger of NetDay and Project Tomorrow in September 2005. The mission of the new combined organization is to support and promote the effective and appropriate use of science, math and technology resources in K–12 education so that every student has the opportunity to fully participate in today's global economy and community.

Long-Range Plan for Technology 2006-2020

Promote Academic Excellence

Teaching and Learning

All learners:

- have access to relevant technologies, tools, resources and services for individualized instruction 24/7.
- use information and communication technologies to collaborate, construct knowledge and provide solutions to real-world problems.
- use research based strategies in all subject areas to improve academic achievement.
- communicate effectively in a variety of formats for diverse audiences.

Educator Preparation and Development

All educators:

- graduate from an educator preparation program that models current technology in instructional and administrative practices PreK-12.
- exit educator preparation programs knowing how to use technology effectively in the teaching and learning process.
- develop new learning environments that utilize technology as a flexible tool where learning is collaborative, interactive and customized.
- ensure integration of appropriate technology throughout all of curriculum and instruction.

Leadership, Administration and Instructional Support

All leaders:

- develop, implement, budget for and monitor a dynamic technology plan to meet the needs of a changing workforce and economy.
- create innovative, flexible and responsive environments to maximize teaching and learning and community involvement.
- Offer expanded curricular and instructional opportunities to students via online, digital technology, and a variety of distance learning technologies
- provide opportunities for sustained, relevant and timely staff development in a variety of formats.
- expect and plan appropriate technology use throughout the teaching and learning process as well as throughout administration.
- Use data effectively and appropriately in decision making.

Infrastructure

An infrastructure system provides:

- access to all e-learning technologies through ubiquitous broadband resources available 24/7 for all users.
- just-in-time technical assistance to support teaching and learning.
- measures to ensure all data is secure and accurate.
- data standards to support interoperability and accessibility for all users.

TEACHING AND LEARNING

Vision

The key to success for all students is the assurance that they are all fully engaged in their learning processes and that there are opportunities in their schools, libraries, homes, and communities that stimulate and initiate this engagement. Texas faces growing challenges in meeting the needs of an increasingly diverse student population. A "one size fits all" approach to teaching and learning does not meet the educational needs and goals for all students. Texas students come from a wide variety of backgrounds and experiences. Many students live hundreds of miles away from other larger communities and do not leave their states or even their communities for exposure to learning opportunities outside the school. All students, can benefit from the rich content, communication with peers across the world, collaboration with experts, as well as access to online instructional resources, distance learning courses, and the multiple avenues for building knowledge and skills through the use of technology. The technology brings the world to the classroom and provides graphical and other communication tools to see the world beyond current boundaries. In addition, the access and use of technology levels the playing field for all students. For example, students with special learning needs benefit from specialized software, customized computer access devices, communication aids, and assistive technology.

The value of educational technology to equalize the learning environment is evident. Where a student goes to school or the school's economic status, size or geographic location should not be an issue for any student. Especially valuable to Texas schools, distance learning is a powerful tool, providing students across the state with equitable access to quality education and instruction. Distance learning enables schools to overcome the potential limitations of their local resources. It can guarantee that all schools are able to offer the courses required for graduation and that students are academically prepared and ready for post-secondary opportunities. Most importantly, distance learning helps provide schools the resources to offer each student the educational opportunities which the individual student may need, including Advanced Placement, dual-credit, opportunities for credit recovery, and other critically needed courses required for graduation. Online learning holds great promise and potential for students in all regions of our state.

The integration of technologies into Texas schools can transform the teaching process by allowing for greater levels of interest, inquiry, analysis, collaboration, creativity and content production. Educators who take advantage of this technology in teaching and learning not only make the learning more engaging and relevant to students but prepare students to live, think, and communicate in the 21st Century. The value of educational technology in schools is dependent on the learning experiences that are brought about by teachers and students. The Texas Long Range Plan for Technology sets parameters and guidelines for new strategies involving curriculum, instruction, and assessment to strengthen the education process through the effective use of 21st Century tools for learning.

All learners:
- have access to relevant technologies, tools, resources and services for individualized instruction 24 hours a day/7 days a week.
- use information and communication technologies to collaborate, construct knowledge and provide solutions to real-world problems and situations that are encountered.
- use research-based strategies in all subject areas to improve academic achievement.
- communicate effectively in a variety of formats for diverse audiences.

There are a variety of challenges for Teaching and Learning. The traditional model of schooling with the teacher choosing what is to be learned and then serving as the source of knowledge as the student acts as the receiver of that knowledge is not adequate for 21st Century, world-class education. Roles of teacher and learner must continue to change. The teacher's role as facilitator, mentor, and co-learner provides this flexibility and exploration with learning. In the Digital Age the sheer volume of information also means that Texas students cannot be passive recipients of instruction;

rather, Texas students must become active participants in the learning process. They need to know that wanting to learn more about a topic or subject than what is taught is a valuable part of learning. It is vitally important that students know how to acquire information, while ensuring their sources are credible and their educational journeys are safe. Additionally, it is important that students gain skills for collaboratively constructing, using, and communicating the knowledge they need for a chosen task, project, or other learning pursuit. Teaching and learning must focus on connecting to students' lives and reflect what research reveals about how people learn. Technology makes collaboration of diverse work and learning groups possible and provides access to rich resources and expertise previously unavailable. Indeed, these technologies enable us to envision learning and student productivity that extend far beyond the walls of the classroom and far beyond the rigidity of traditional school district boundaries.

No Child Left Behind legislation included requirements for technology literate eighth graders and the full infusion of technology into curricula and instruction. These requirements are defined and supported through the required Technology Applications curriculum. All learners—students and educators—need to seamlessly use technology to acquire information, solve problems, and communicate to thrive in the 21st Century.

Challenges that impact Teaching and Learning include: the need for curriculum alignment that ensures that the technology is seamlessly integrated into curriculum and instruction; the need for more time for opportunities to visit classrooms, explore best practices in educational technology, and learn new curriculum strategies; and more flexibility to try new methods of teaching and learning. Only when these challenges are met, will Texas students be prepared to live, work, and thrive in the 21st Century.

Recommendations to the Texas Education Agency

1. Continue to support the implementation and revision of the Technology Applications Pre-Kindergarten Guidelines and Technology Applications Texas Essential Knowledge and Skills (K-12) to ensure appropriateness of requirements through time and alignment with 21st Century skills.

2. Continue to support the implementation and revision of TEKS in all content areas and include reference citations to the Technology Applications TEKS within the foundation TEKS.

3. Continue to support the Technology Applications high school courses and their role in teaching advanced technology knowledge and skills while supporting core curriculum content.

4. Support the continued submission, adoption and use of Technology Applications Instructional Materials that meet interoperability standards and facilitate seamless integration of technology into teaching and learning.

5. Develop and provide to school districts strategies and options to be used to measure student mastery of the Technology Applications TEKS at grades two, five, and eight and require districts to report the results of student mastery to TEA.

6. Provide leadership, support, and oversight for school library programs, including the implementation and revision of school library standards.

7. Provide statewide access to the Texas Library Connection resources for students and teachers that support the curriculum and promote student engagement and academic success through equitable access to these resources.

8. Encourage and support the continued development of innovative programs and technical standards designed to increase access to online learning tools and content for all learners, including those with disabilities.

9. Promote the development and use of innovative strategies for the delivery of curricula and instruction through online, digital technology, and a variety of distance learning technologies.

10. Develop and implement a coordinated, statewide initiative, including standards, policies, and programs to support and provide equitable access to quality online content, courses, instruction and professional development delivered via online, digital technology, and a variety of distance learning technologies.

11. Develop an online Texas Teacher Resource Center that provides students, parents and educators with technology-based resources that support and enrich the state-mandated curriculum.

12. Provide access to research-based studies and best practices for use of technology to transform teaching and learning and enhance student achievement.

13. Encourage and support the development of innovative programs that promote parental involvement, increased communication with parents, and community access to learning resources.

Recommendations to the State Board for Educator Certification

1. Require mastery of the SBEC Technology Applications Standards, for all educators, including campus administrators and librarians as access to technology and professional development becomes available.

2. Continue to support the implementation and revision of certification standards for each certification area that includes technology proficiencies for educators that reflect best practices and emerging technologies in teaching and learning.

Recommendations to the Regional Education Service Centers

1. Establish and provide a menu of services for schools to support the implementation of the Long-Range Plan for Technology 2006-2020 and of regional and local educational technology initiatives.

2. Support the implementation of the Technology Applications TEKS, including technology literacy.

3. Participate in partnerships with providers of instructional resources and services that align with state and national standards, offer cost efficiencies, and ensure accessibility for all learners.

4. Provide to educators and students a facilitated preview of Technology Applications Instructional Materials and other electronic/online materials provided through state licenses and adoptions.

5. Assist districts and teachers in developing strategies to monitor and document progress of their integration of technology into their curricula and instruction as well as to monitor and report student mastery of the Technology Applications TEKS to TEA.

6. Provide support for instructional content and courses for students and educators delivered via distance learning.

7. Assist the TEA in providing resources for students and teachers through an online Texas Teacher Resource Center.

8. Identify and promote best practices and innovative services in support of technology planning and use of technology to transform teaching and learning and showcase at regional and state events as well as through examples on regional and state websites.

9. Provide school library media support to ensure that school libraries have the necessary resources and skills to best serve their students, teachers, parents, and community.

10. Assist schools in interpreting student formative data to develop supporting lessons that incorporate the use of technology and demonstrate how software applications can be used to document progress in meeting curriculum and assessment objective.

Recommendations to Local Education Agencies

1. Integrate the Technology Applications TEKS within the foundation curriculum at each grade level and provide specialized courses in Technology Applications.

2. Offer and provide the Technology Applications high school courses to meet the curriculum and graduation requirements specified in 19 TAC Chapter 74.

3. Use the Technology Applications adopted instructional materials at all grade levels.

4. Use digital diagnostic tools for formative evaluation to monitor progress toward the mastery of instructional objectives.

5. Implement research-based strategies to improve the academic achievement, including technology literacy, of all students.

6. Develop strategies to monitor and document progress of integration of technology into curricula and instruction and to monitor and report student mastery of the Technology Applications TEKS to TEA.

7. Integrate student performance data from district/state assessment instruments with electronic curriculum resources to inform and differentiate instruction for every child.

8. Support the use of emerging technologies aligned with state standards for developing greater levels of collaboration, inquiry, analysis, creativity and content production.

9. Ensure anytime/anywhere access to technology-based learning for all students by providing appropriate devices, services, and support.

10. Ensure that school libraries have the latest technology and online resources for student research and curriculum integration.

11. Support school library programs and use library standards to ensure that school libraries assist classroom teachers in teaching information literacy and Technology Applications knowledge and skills.

12. Support the use of technology to promote student-centered learning across geographic and cultural boundaries that includes business and industry.

13. Utilize innovative strategies for the 24/7 delivery of specialized or rigorous courses and expanded curricular and instructional offerings through the use of technology, including online and other distance learning and digital content services to meet the diverse and personal learning needs of all students.

14. Provide curriculum to ensure personal safety for students in a digital world and Acceptable Use Policies that specify expectations and rules for students, parents, and teachers.

15. Implement innovative programs that promote parental involvement, increased communication with parents and community members, and community access to educational resources.

16. Support teachers in developing classroom websites and online resources to share lessons, monitor student progress, and establish regular communications with parents and students.

Recommendation to Texas Higher Education

1. Require the integration of Technology Applications Educator Standards into teaching and learning for all higher education faculties, particularly those engaged in educator preparation and development.

2. Provide pedagogical support for transforming teaching and learning based on research and proven models for systemic change in the classroom.

3. Expand collaboration between public schools and higher education to develop innovative course delivery and virtual credit acquisition.

4. Encourage participation by higher education institutions in partnerships with schools to pursue grant opportunities that enhance and support technology integration.

5. Encourage participation by higher education institutions in partnerships with the private sector and public entities to develop and provide web-based instructional resources and services.

6. Ensure delivery of dual credit courses for K-12 students using online and distance learning.

Recommendations to Parents, Communities, and Private Sector

1. Use existing and emerging networks for 24/7 services, information and extended learning.

2. Participate in collaboration with representatives from PreK-12, higher education, parents, businesses and community to share resources and services.

3. Support the use of technology in the classroom to improve productivity, increase student achievement, and promote best practices.

4. Collaborate with classroom teachers to extend learning opportunities for students into the community.

5. Collaborate with schools in updating expectations for technology proficiencies in the TEKS to ensure alignment with technology advancements in the workplace.

6. Participate in partnerships to develop and provide low-cost, web-enabled products and services to support technology-rich learning environments.

7. Provide educators, students and parents opportunities to experience technology's role in the workplace.

8. Provide technology-based work experiences for educators and students through internships and other means that result in licensure or certification.

Educator Preparation and Development

Professional learning is an ongoing process that provides current educators with the knowledge and skills and classroom strategies to transform teaching and learning. Continuous professional learning is essential for all educators. Whether teaching and learning are impacted through the use of educational technology is directly related to the experiences that are brought to the classroom. These classroom experiences are dependent on an educator taking the initiative to increase personal learning through ongoing professional development or continuing education. Technology can impact curriculum and instruction, but for this to occur, teachers need to learn to incorporate technology appropriately to support the curriculum and bring about learning opportunities that would not be possible without the technology.

For those who will enter the education system, it is critical that preparation programs model the appropriate use of technology. Meeting Technology Applications educator standards is required of all beginning teachers. Educator preparation programs should continue to provide coursework that addresses these standards and their relationship with core subject areas. In the case of veteran teachers, ongoing job-embedded professional development must be provided to assure mastery of the SBEC Technology Applications Standards for all teachers.

Vision

As students who have grown up with technology enter Texas classrooms, it is essential that all professional educators acknowledge that the world in which they live today, and the world that their students will enter as adults, is radically different from what existed in even the fairly recent past. Teachers must be able to prepare students for their future in a manner that assures that all students will not simply survive, but truly thrive in the world that awaits them. Today Texas faces a critical urgency for all professional educators, both current and those who will enter the education system in the future, to have the skills needed to change instruction to meet the needs of this generation of Texas students.

All educators:

- graduate from an educator preparation program that models current technology in instructional and administrative practices PreK-12.

- exit educator preparation programs knowing how to use technology effectively in the teaching-learning process as demonstrated by the SBEC Technology Applications Standards.

- develop new learning environments that utilize technology as a flexible tool where learning is collaborative, interactive and customized for the individual learner.

- ensure full integration of appropriate technology throughout all curriculum and instruction.

Preparing educators to effectively facilitate and manage 21st Century learning in technology and information-rich settings involves essential retooling of the existing professional core of the educational system. Securing time, resources, and effective models for educator professional development presents a tremendous challenge to the state and to the entire nation. Professional development carries the urgent charge of supporting the move from traditional schooling to 21st Century education. To promote 21st Century learning, educators must be competent in 21st Century skills. It is the system of teacher and administrator preparation that fuels the education of young Texans with qualified and skilled personnel. Texas must prepare teachers for significantly diverse roles, students, and technologies. This realization presents the PreK-12 community and educator preparation institutions with great challenges. Professional learning should include new ways to teach that lead to improvements in student academic achievement. It should use instructional strategies that reflect current research, modern contexts to engage students in learning, and classroom assessments that

effectively measure what students are learning. This learning should emphasize technology infusion that helps educators visualize, internalize and create technology-enhanced learning environments.

Professional development must ensure that all educators understand the importance of learning about educational technology and the many possibilities of its use. If teachers and administrators are to transform the teaching and learning process to prepare today's students for the world they will encounter upon leaving the K-12 system, they must be given the knowledge, skills and tools they need. They must also recognize the need to change the way teachers are teaching if instruction and the tools used for learning are to be relevant and meaningful to today's students. The role of professional development is to teach teachers how to transform their teaching and learning, to renew and invigorate their passion for teaching, to acquire the new pedagogical and technology skills they must have, and to understand how to successfully integrate technology into instruction, across the curriculum, at all grade levels.

Educator preparation programs must ensure that beginning teachers have received a broad understanding of the many uses of technology in 21st Century classrooms. Beginning teachers need a variety of experiences and competencies to be prepared to teach today's digital students. Collaboration between higher education and PreK-12 schools is essential to ensure that the beginning teacher is prepared for today's classroom.

Distance learning, especially online learning, is an important strategy for providing today's teachers and administrators as well as those going through preparation programs with new opportunities for professional growth. It can lessen the number of educators teaching outside their area of certification or expertise, and reduce critical teacher shortages.

Recommendations to the Texas Education Agency

1. Require and support high-quality, professional development to ensure the effective use of technology and full integration of technology across all subject areas and all grade levels and to further the implementation of the Technology Applications TEKS and the acquisition of SBEC Technology Applications standards by all educators.

2. Promote professional development to support the use of Technology Applications instructional materials, digital resources, technology-based tools, online and other distance learning technologies and assistive technology solutions.

3. Establish requirements for professional learning for all educators.

4. Require districts to annually report the number of educators that meet the SBEC Technology Applications standards.

5. Establish a technology professional development initiative to assist educators in reaching the Target Tech level on the STaR chart.

6. Encourage and support the Master Technology Teacher program.

7. Continue to collaborate with adult literacy service providers (ESCs and/or other professional development providers) to develop programs to maximize the use of technology.

Recommendations to the State Board for Educator Certification

1. Continue to revise and update requirements for educator preparation and development in integrating technology into teaching and learning, instructional management, professional development and administration.

2. Implement a Technology Applications Supplemental Endorsement aligned to the SBEC Technology Applications Standards.

3. Include standards for Technology Applications proficiencies in all educator certification and renewal requirements.

4. Continue to support the implementation and revision of the Technology Applications, Computer Science, and Master Technology Teacher certification standards and examinations to ensure appropriateness of content and items through time.

5. Continue to support Technology Applications certifications for all educators through the development of performance-based, on-line assessments and/or electronic portfolios.

6. Continue to support online educator professional development leading to certification.

7. Continue to support the implementation and revision of the Technology Applications portion of the Pedagogy and Professional Responsibilities TExES at each certification level to ensure that appropriate performance-based items are provided to test ALL beginning teachers' mastery of Technology Applications SBEC Standards I-V.

8. Include Technology Applications as a subject area that is a part of the generalist teaching certificates at grades EC-8 to ensure that all EC-8 teachers with a generalist certificate can teach Technology Applications Texas Essential Knowledge and Skills as a part of classroom instruction.

Recommendations to Regional Education Service Centers

1. Disseminate information on technology integration focusing on the Technology Applications proficiencies for educators and students.

2. Provide standardized professional development to educators on the implementation of the Technology Applications TEKS across all subject areas.

3. Design, implement, and evaluate effective professional development programs and support schools that need help in the designing, implementing, and evaluating effective professional development programs that facilitate technology integration into teaching and learning, instructional management, and administration.

4. Utilize online and other distance learning technologies for delivery of professional development.

5. Assist districts in providing research-based professional development that addresses the technology standards set by the State Board of Educator Certification.

6. Design and implement research-based professional development for local technical support personnel.

7. Integrate SBEC Technology Applications proficiencies into all teacher preparation programs.

8. Provide professional development in interpreting student formative data to develop supporting lessons that incorporate the use of technology and demonstrate how software applications can be used to document progress in meeting curriculum and assessment objectives.

9. Provide professional development to assist districts in documenting and reporting progress in fully integrating technology into curricula and instruction.

Recommendations to Local Education Agencies

1. Provide professional development for teaching and integrating Technology Applications into the foundation and enrichment TEKS through multiple delivery methods.

2. Provide professional development for Technology Applications courses as identified in SBEC Technology Applications standards VI - XI.

3. Provide training on the use of electronic tools and information to support sound, data-driven decision-making.

4. Develop strategies for all educators, including campus administrators and librarians, to master the Technology Applications Educator Standards I-V as access to technology and professional development becomes available.

5. Document progress of teachers towards mastery of Technology Applications Educator Standards I-V using the Texas STaR Chart.

6. Encourage participation in statewide, technology professional development opportunities.

7. Encourage educator participation in the Master Technology Teacher program.

8. Utilize innovative strategies for the 24/7 delivery of ongoing professional development through the use of technology, including online and other distance learning and digital content services to meet the diverse and personal learning needs of all educators.

9. Provide instructional coaches and mentors to support classroom efforts in using technology to improve learning in core curriculum areas.

Recommendations to Texas Higher Education

1. Establish and implement continuing education requirements for Higher Education faculty on the integration of technology into teaching and learning.

2. Design and implement educator preparation and development programs that meet state certification standards and expectations for technology proficiencies.

3. Support field-based educator preparation and development on the integration of technology into teaching and learning.

4. Model administrative leadership of the use of technology throughout higher education institutions.

5. Encourage the provision of coursework and certification programs by higher education institutions that incorporate Technology Applications standards to equip educators to meet national and state technology standards.

6. Encourage the utilization of online and other distance learning for delivery of professional development and degree programs by higher education institutions.

7. Collaborate with K-12 and institutions of higher education in Texas and other states to eliminate barriers to teaching and learning and professional development delivered via online and other distance learning technologies.

Recommendations to Parents, Communities, and the Private Sector

1. Provide opportunities for educators and community members to access technology systems, resources, and associated training.

2. Collaborate with educators on the provision of staff development for the utilization of emerging technology products and services to meet educational needs.

3. Collaborate with the education community on technology advancement in the workplace and its impact on teaching and learning.

Leadership, Administration and Instructional Support

Vision

Implementing and sustaining school improvement and technology innovation depends on skilled and persistent leadership with the ability to share visions and consistent expectations. It is imperative that public education be transformed to meet the demands of the 21st Century and students be equipped with 21st Century skills. All students, those who pursue post-secondary education and those who seek employment upon graduation, must be fully prepared for today's workforce, which demands a high level of knowledge and skills and a high degree of technology competency.

The effective use of technology, in teaching and learning, in educator preparation and development, and in school administration is essential. Additionally, distance education—online learning in particular—is key to providing students with the courses and expanded educational opportunities necessary for them to be academically ready and prepared for post-secondary opportunities.

Administrators must understand and illuminate the possibilities that technology brings to education, model the use of technology as an Integral part of their professional activities, and take a leadership role in assuring others do as well. They must help others see what is possible and create the path for them to follow. Administrators are expected to embrace technology for daily tasks as well as capitalize on the use of quality data to drive decisions.

District and school administrators play a key role in cultivating a shared vision and serve as a catalyst for change. Effective school administrators conduct needs assessments to determine strengths and challenges that will impact planning and implementation of educational technology in schools. As leaders, administrators must envision, fund, and assess the use of technology in schools. Administrators share the vision by utilizing a robust technology plan that provides effective and efficient technology implementation for student, faculty, administrative and community use. To develop a technology plan with a shared vision, school administrators need to create an on-going technology committee with representatives from key stakeholder groups. Leaders and their technology committee will understand the state and federal requirements for technology plans required by the No Child Left Behind Act and the Federal Communications Commission for E-rate discounts. Leaders will also require business continuity plans for recovery of technology systems in case of man-made or natural emergencies.

Plans are needed to ensure student records, electronic instructional materials, financial and personnel records are accessible if facilities are compromised. School leaders will ensure recovery of communication systems such as web servers and email systems to maintain crucial communication with the public.

Strong leadership at all levels can make the vision for technology a reality across all four areas of this plan. Motivating those leaders and ensuring their capability to do so is of highest priority to the effective implementation of this Long-Range Plan for Technology in Texas schools.

All leaders:
- develop, implement, budget for and monitor a dynamic technology plan that align resources to improve student learning and support school operations.
- create innovative, flexible and responsive environments to maximize teaching and learning and community involvement.
- offer expanded curricular and instructional opportunities to students via online, digital technology, and a variety of distance learning technologies.
- provide opportunities for sustained, relevant and timely staff development in a variety of formats.
- expect and plan appropriate technology use throughout the teaching and learning process as well as throughout administration.
- use data effectively and appropriately in decision making.

The changes caused by integrating technology in schools promote school reform. Complex school-wide innovation, vision building, administrator commitment, and skilled leadership play pivotal roles in success. Texas faces a significant challenge in providing visionary school leadership with the necessary background requisite skills to lead and nurture the

changes technology brings. Rapid changes on many fronts make it difficult for any individual within a school system to maintain the necessary knowledge to represent all facets of technology planning and implementation. For this reason, collaborative and ongoing planning consistent with the Long-Range Plan for Technology, articulated with campus and district plans, is necessary if schools are to see improved student learning and data-driven decisions. Fulfilling the vision of technology requires district, campus, and teacher leaders who can articulate and advocate a vision of technology's significance for teaching, learning, and school operations.

Effective school leaders must also model as well as expect effective use of technologies. Systems of technical support, staffing patterns, budgeting functions, and funding acquisitions require ongoing professional and staff growth. Allocating sufficient time for professional development is essential but poses challenges in balancing priorities. Online professional development opportunities can often assist in this area. Appropriate instructional support services are required in order to ensure teachers fully integrate technology into the curriculum and maximize educational benefits from the investment in technology.

Leaders must plan effectively to create innovative, flexible and responsive learning environments to maximize teaching and learning. Schools are vulnerable to special challenges for staff retention as demands grow in the booming technology, math and science sectors for personnel. School decision-makers face challenges in budgeting for all aspects of technology implementation and securing funding to support that budget.

Recommendations to the Texas Education Agency

1. Provide leadership and vision in planning for the effective integration of technology into teaching, learning, school, and district operations and support local leadership.

2. Provide electronic information and tools to support the adoption of digital instructional resources and technology-based tools and services.

3. Require and support quality planning by school districts through the continued use of statewide technology planning resources including, but not limited to, the Texas Campus and Teacher STaR Charts and the Texas ePlan system.

4. Provide leadership in research-based data-driven decision-making.

5. Develop minimum guidelines for recovering critical technology systems that support student learning and school operations.

6. Develop and maintain secure information access and confidentiality policies and provide electronic access to non-secure data files.

7. Foster innovative use of technology and use current industry and business standards to document, analyze and report student progress.

8. Encourage compliance with interoperability and accessibility data standards to ensure data integrity and economic efficiencies in technology purchases.

9. Require compliance with the accessibility standards outlined in Section 508 of the Rehabilitation Act, as a requirement for the interoperability of all software, assessments, or other programs that are required or funded by the state.

10. Provide leadership in the effective use of technology for collection and management of data to meet local, state and federal reporting requirements.

11. Continue to maintain statewide electronic student records for documenting placement and progress in order to better serve a mobile society.

12. Design and implement education initiatives with business and industry.

13. Coordinate funding processes to maximize benefits to schools in the acquisition, maintenance, and use of technology.

14. Provide guidelines and support for online, digital technology, and a variety of distance learning and distributed learning to equalize educational learning opportunities for students and educators, including those with disabilities.

15. Conduct ongoing review and revision of policies regarding credit accrual in online and other distance learning courses.

16. Continue to utilize an Educational Technology Advisory Committee to conduct external reviews of state education technology initiatives and to make recommendations to the legislature.

17. Continue to leverage discretionary funds to foster innovation in teaching, learning, and assessment in traditional and electronic learning environments.

18. Continue to participate with the Texas Higher Education Coordinating Board in evaluating procedures for concurrent enrollment of high school students through a variety of venues including online and distance learning.

Recommendations to Regional Education Service Centers

1. Provide training and technical assistance to administrators for campus and district technology planning, budgeting, integration strategies and research-based data-driven decision-making through the examination and analysis of data.

2. Offer information and services related to grants and funding opportunities.

3. Provide information, technical assistance and support services to district administrators in selecting and using efficient and effective technology systems to meet local, state and federal performance targets.

4. Maintain expertise for supporting schools, districts, and individual staff in integration of technology in teaching and learning, instructional management and administration.

5. Model administrative leadership in the use of technology throughout the ESC organization.

6. Provide training and technical assistance for business continuity planning.

Recommendations to Local Education Agencies

1. Incorporate ongoing technology planning in classroom, library, campus and district improvement plans.

2. Promote a comprehensive planning process to ensure technology plans include clear goals, realistic strategies, and critical components such as compliance with state and federal regulations, needs assessment, budget and evaluation. Identify budget and secure funding to support technology identified in classroom, library, campus, and district planning efforts.

3. Include professional development on the integration of technology in all classroom, library, campus, and district improvement plans and measure their effectiveness against assessment tools such as the STaR charts.

4. Ensure a viable technology plan is written and approved prior to applying for the federal E-Rate discount program.

5. Utilize the district technology plan to ensure technology resources promote student achievement in accordance with No Child Left Behind.

6. Allocate at least 30 percent of technology allotment budget for professional development.

7. Include community input into the planning and support for the integration of technology into teaching and learning.

8. Coordinate the use of electronic data in district planning to support research-based decision-making focused on student success.

9. Initiate and implement policies to expand parental and community access to school facilities, library resources, and non-secured data through technology.

10. Provide instructional assistance for the effective integration of technology into teaching and learning in all school and district operations.

11. Provide parents secure electronic access to student information.

12. Incorporate mastery of SBEC Technology Applications Standards into local educator appraisal systems.

13. Participate in collaboration with representatives from PreK-12, higher education, parents, businesses and community to share resources and services.

14. Create business continuity plans that ensure critical technology applications can be recovered in a timely manner including electronic student records, instructional materials, financial and personnel records and communication systems such as email and web pages.

15. Budget for, offer, and support expanded curriculum and instructional opportunities to students via online and other distance learning.

Recommendations to Texas Higher Education

1. Promote coordination with the Texas Education Agency, institutions of Higher Education, Local Education Agencies, and other entities to improve delivery of instructional services via technology.

Recommendations to Parents, Communities, and the Private Sector

1. Participate in on-going technology planning initiatives.

2. Assist in business continuity planning including offering local services in times of emergencies.

3. Participate in collaboration with representatives from PreK-12, higher education, parents, businesses and community to share resources and services.

4. Promote community awareness of learning opportunities available through the use of technology resources.

5. Provide financial as well as volunteer support for Local Education Agencies.

INFRASTRUCTURE FOR TECHNOLOGY
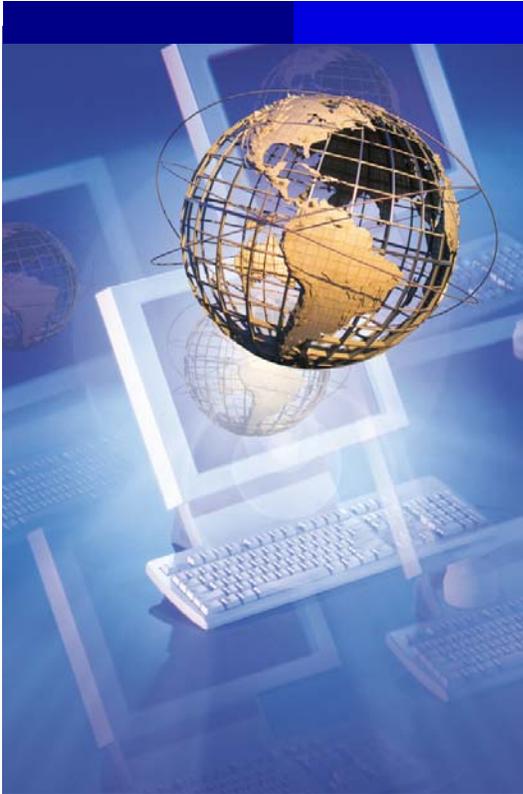
Vision

Texas has made tremendous strides during the last decade in connecting schools to each other, to external resources, and to the Internet. Teachers and students are using Internet as a major educational resource that is now an expected education standard. However, Texas must plan for a 21st Century educational environment. Texas will need a truly high-performance infrastructure to take advantage of new technologies that can significantly reduce costs, increase student access, and improve communication and collaboration among all stakeholders.

A 21st Century infrastructure will offer high-speed connectivity among schools, colleges, medical facilities, libraries, businesses, and homes and will be equipped with ample digital tools and resources for all learners. This robust state-wide infrastructure is critical to provide equitable access to all learners. Districts must have an infrastructure that is safe and secure, flexible, scalable, and reliable. The campus infrastructure will integrate voice, video, and data and will have the capacity to host large volumes of digital content and powerful applications. Schools will meet the high expectations of technology-savvy students with anytime, anywhere connectivity. This environment will support education and innovation and become an indispensable layer in supporting the state economy. This infrastructure will provide easy access to tools that will allow students and teachers to access online information and materials, do collaborative work and broadly share resources. A strong sense of community will be created that is conducive to interdisciplinary projects and expansion of learning beyond the traditional classroom. Teachers, parents, and administrators will have immediate access to data and information essential to the success of students and the effective and efficient operation of schools. The human infrastructure of skilled individuals will be available to ensure the reliability of the technical environment and support the effective uses of technology in teaching and learning.

The infrastructure of a school is the critical element of support for all four areas of this plan: teaching and learning; educator preparation and development; leadership, administration and instructional support; and infrastructure for technology.

An infrastructure system will provide:

- equitable access to all e-learning technologies through ubiquitous broadband resources 24/7 for all users.
- just-in-time technical assistance to support teaching and learning.
- measures to ensure all data is secure and accurate.
- data standards to support interoperability and accessibility for all users.

Texas schools have been fortunate to have the support of the Texas legislature and the federal government in building the technology infrastructure that allows students and teachers to make use of technology tools that are basic and necessary for education today and in the future. However, work remains to ensure that connectivity reaches all instructional and professional work areas and that infrastructure capacity supports promising practices in instruction, school leadership, and operations. Current connectivity must be sustained through regular maintenance, upgrades, and technical support. Not all districts, campuses, and classrooms have the connectivity and tools that they need to integrate technology into the teaching and learning process. The loss of funding from the Telecommunications Infrastructure Fund has had a significant impact on school infrastructure. Many districts are struggling to maintain current connectivity and keep network equipment functioning. While some have been able to pass bonds to fund technology infrastructure, others do not have the ability to tap such resources. It is imperative that Texas continues to invest in high-speed connectivity for schools to provide equitable access for all students. A stable infrastructure requires consistent and reliable funding to ensure the support for current and emerging technologies for the most effective and efficient delivery of services.

Districts must have individuals with the technical and networking skills to ensure that networks remain reliable, secure, flexible and available to meet the ever-changing needs of the school. As schools increase their dependency on the infrastructure for management of student information, curriculum, instructional resources, accountability, professional development, transportation and other administrative functions, reliability and rapid response to technical support needs are critical. Infrastructure plans must allow for scalability to support the growth in students, applications, and functionality. Disaster recovery planning is also essential. Last mile issues continue for districts in remote and rural areas of the state where telecommunications providers and qualified personnel are limited.

Data-driven decision-making warrants the ability to have access to vast amounts of data from a host of software programs and online resources. Data from online testing should easily integrate into curriculum management programs that allow educators to not only analyze data but also tie that data directly to curriculum planning to customize instruction to meet individual student needs. Texas must adopt standards to help districts work more effectively and efficiently and also address compliance with the Section 508 accessibility standards to ensure access for individuals with disabilities.

A 21st Century infrastructure is required to provide a quality education to all students. Through technology, students can receive a personalized, customized education tailored to fit their individual learning needs and provide opportunities for success in the workforce and higher education.

Recommendations to the Texas Education Agency

1. Partner with other state agencies and institutions of higher education to develop and implement a high-speed, high-capacity statewide telecommunications network.

2. Participate in the collaboration between public and private entities to provide 24/7 equitable access to robust broadband network resources for all students, educators and parents.

3. Promote the use of the local, regional, and/or statewide technology and telecommunications infrastructure to support teaching and learning, educator preparation and development, parental involvement, and community access.

4. Request and support the provision of a 1:1 ratio of network-ready personal computing devices for all students, teachers and administrators.

5. Encourage state funding for regional education service centers to support the connection of wide area networks to the high-speed high capacity statewide telecommunications network.

6. Maintain industry infrastructure standards for technology to assist school districts in technology planning and implementation of infrastructure that is operable 24/7.

7. Establish network architecture models, consistent with the FCC's E-Rate Long Range Plan, to support emerging technologies and to guide long-range technology planning efforts of school districts.

8. Provide a common, statewide interoperability data standard for PEIMS submissions and inter-district data exchange.

9. Request funding to implement the *Texas Long-Range Plan for Technology, 2006-2020.*

10. Encourage business continuity testing to ensure recovery of critical technology applications in a timely manner.

11. Continue to study the effective use of emerging technologies and the benefits of an integrated delivery system for more equitable and cost-effective delivery methods.

Recommendations to Regional Education Service Centers

1. Maintain and expand the regional technology and telecommunications infrastructure to meet the growing demands of school districts.

2. Provide equitable and cost-effective connectivity to a high-speed, high-capacity statewide telecommunications network and to other national and worldwide resources.

3. Provide a competitive forum for regional collaboration to maximize the use of local, regional, and statewide technology infrastructure through grants, cooperative purchasing, and the sharing of resources such as online content, courses and professional development.

4. Offer technical assistance and support to schools for technology infrastructure planning, business continuity planning and testing purchasing, operations, maintenance, troubleshooting, and security.

5. Support statewide infrastructure initiatives such as TETN, Internet2, and a statewide telecommunications intranet.

6. Facilitate the deployment and support of infrastructure to ensure 24/7 accessibility for student assessment and curricular initiatives both on and off campus.

7. Provide technical assistance in securing E-Rate and other discounts to maximize the fiscal resources required for infrastructure.

Recommendations to Local Education Agencies

1. Design, install and maintain a technology and telecommunications infrastructure for communications and services that ensures equitable access.

2. Develop innovative funding and collaboration strategies with both public and private sectors to ensure all students have equitable and anytime, anywhere access to broadband communications.

3. Build community support for anytime, anywhere Internet access through collaborative planning, education, public information and other means.

4. Strive to achieve and maintain a personal computing device ratio of 1:1 for both students and professional educators.

5. Provide on-demand access to appropriately configured technology for all students and staff, including those with disabilities, in libraries, school offices, and other work areas.

6. Strive to participate in the high-speed, high-capacity statewide telecommunications network.

7. Maintain an obsolescence policy to ensure maximum efficiency and use of technology and infrastructure by all students and staff.

8. Provide and maintain an infrastructure for communications with parents and community members, including year-round access to school news, educational resources, data and personnel.

9. Provide access to digital instructional tools that meet interoperability and data accessibility standards for instruction.

Recommendations to Texas Higher Education

1. Acquire and maintain current technology for educator preparation facilities.

2. Establish infrastructure partnerships with Regional Education Service Centers and Local Education Agencies for 24/7 content delivery and professional development.

3. Provide an advanced statewide network giving institutions of higher education access to global resources and related services.

4. Partner with TEA and LEAs to design and implement an accessible high-speed intranet with access to national and international resources.

Recommendations to Parents, Communities and the Private Sector

1. Support 24/7 access for parents and community to personal computing devices and to existing and emerging networks for communication with schools and community learning facilities.

2. Support the establishment of affordable and accessible wireless networks for all users.

3. Develop strategic partnerships with local education agencies to foster infrastructure support, including promotion of interoperability and accessibility, and the use of open-source software and web-based services.

4. Develop software applications that meet interoperability, accessibility, and usability standards, assist schools in data-driven decision-making, and enable 24/7 parental access.

5. Develop low-cost, standardized, accessible, scalable, personal computing devices and services for PreK-12 students to support educational objectives and enable 24/7, 1:1 computing.

6. Develop strategic partnerships with communities to provide 24/7 accessible wireless networks and computing devices available for all citizens.

7. Establish competitive statewide utilities for high-speed broadband connectivity that can provide low cost, equitable Internet access for all students both from school and from home to support anytime, anywhere online and distance learning.

8. Establish network infrastructure construction codes for public school buildings, consistent with the FCC's E-Rate Long Range Plan, to support current and emerging technologies.

Study of Needs That Will Enable Schools to Achieve Target Tech in Texas

Educational Technology Advisory Committee (ETAC) members in Texas have served for many years to provide recommendations to the Texas Education Agency and the state concerning educational technology leadership issues in Texas. They have also been instrumental in developing the Texas Long-Range Plans for Technology and in developing the District, Campus, and Teacher School Technology and Readiness (STaR) Charts, which serve as one of the measures used by districts and the state to assess the progress of districts and the state in meeting the state's educational technology goals. The current ETAC members were appointed in October 2004 and charged with the development, implementation, and evaluation of a new *Long-Range Plan for Technology, 2006-2020*. This new long-range plan will guide districts in Texas in the effective use of technology in a way that will prepare students to learn and work in the 21st Century.

In reviewing the existing plan, the committee acknowledged the significant progress that has been made in implementing the current plan. Some goals have been accomplished; some are in the process of being accomplished; and some

still need to be addressed. Texas students deserve and need fully integrated access to technology in order to gain the skills that they need to learn and work in the 21st Century. However, in order to create a new educational technology plan, existing barriers to the continued effective implementations of the current plan and the development and implementation of the new plan had to be identified and addressed. This committee has attempted to do just that in order for state decision makers to have the information that they need to address these barriers. Texas educational leaders must have a vision for the new time frame (2006-2020) that is truly visionary and serves the needs of Texas students, and to do so these barriers must be overcome.

In an effort to gauge the current status of educational technology implementation and the ability of districts to meet the goals of the *Long-Range Plan for Technology, 1996-2010* educational technology leaders statewide were surveyed and provided valuable input. Additional data was reviewed and analyzed from a variety of sources, including summaries of the School Technology and Readiness (STaR) charts. Data was also analyzed from *Education*

Week's Technology Counts longitudinal reports; the *2002 Update to the Long-Range Plan for Technology, 1996-2010*; the Telecommunications Infrastructure Fund data; the TEA Web site data; and other sources. The *National Education Technology Plan 2004* also provided valuable insights and support. The committee has identified the elements that are essential to building and maintaining 21st Century learning environments and to developing students who are capable of competing in a global economy. The most important of these elements is a cohesive partnership between the state and local educational agencies, regional Education Service Centers, and higher education to provide the administrative and instructional support, infrastructure, professional development, certifications, and progress measures required to equip teachers and students with 21st Century skills. Ultimately, the long-term health of the state economy depends on the investment that is made in students today. With dedicated state funding for technology combined with local funding, leadership, and vision, Texas will continue to lead the nation in effectively utilizing technology to meet the unique educational needs of all students.

Summary of Findings

The Educational Technology Advisory Committee has identified the immediate issues that need to be addressed in order for Texas to regain its momentum in preparing students to learn and work in the 21st Century. These issues include but are not limited to:

- A realistic and dependable funding model is needed to expand and sustain student and teacher workstations, ongoing professional development, instructional and technical support, and a robust technology infrastructure.
- Leadership and support in the area of educational technology to districts, through funding for the TEA and the Education Service Centers (ESCs), will enable districts to obtain services through a consistent, efficient, equitable and effective system.
- Districts need strategies to measure the progress of students and teachers in meeting the needed Technology Applications proficiencies that are critical to teaching and learning in the 21st Century.
- The continuation of telecommunications discounts through both the state's Telecommunications Infrastructure discount program and the federal E-Rate program are essential for districts to provide the telecommunications connectivity, bandwidth, and infrastructure that will be needed.
- Software interoperability standards must be established to maximize use of funds for programming and conversion expenses.

Requests to the Texas Legislature

Dedicated Educational Technology Funding

Recognize the need to increase the Technology Allotment

Funding the Technology Allotment to enable districts to reach and maintain the Advanced Tech level of the Texas STaR Chart would require a minimum of $123 per ADA. Current funding is just over $27 per ADA. Original legislation called for the allotment to start at $30 per student per year and increase by $5 per year until it reached $50 per student. Since 1992, the allotment has remained at $30 or less per student. The allotment is currently funded from the Telecommunications Infrastructure Fund (TIF). Using a phased in approach, the Technology Allotment should be increased to at least $50 per student for 2007-2008 and increase by $10 per year until it reaches at least $123 per student.

Current Annual Allotment 2007-2008
Approximately $27 per student

2007-2008	2008-2009
$50 per student	$60 per student

Recognize the need for additional funding for Infrastructure and Related Technical Support

An Infrastructure Allotment including funding to implement disaster recovery plans to maintain access to essential technology services and communication is essential to maintain a statewide infrastructure to support teaching and learning, provide access to data for decision-making, and to conduct the business of schools. There is no current state funding for this purpose. The request is to establish the Infrastructure and Related Technical Support Allotment at $35 for 2007-2008 and increase as demands for infrastructure continues to grow through the year 2020. This allotment could be funded through the Telecommunications Infrastructure Fund.

Current Allotment	$0

2007-2008	2008-2009
$35 per student	$35 per student

Statewide Leadership and Support

Recognize the need for funding for statewide leadership and support for educational technology at TEA and Education Service Centers

Funding is essential for the Texas Education Agency and the Education Service Centers' educational technology departments to provide leadership and support with $1 million for TEA and $450,000 average per ESC x 20 ESCs. Additional funding should also be provided for the implementation of any additional legislation that requires TEA and ESC leadership.

Current Funding	$0

2007-2008	2008-2009
$10,000,000	$10,000,000

Accountability

Require reporting of student Technology Applications proficiencies for appropriate grade levels as required for No Child Left Behind and state accountability.

Current Funding $0

2007-2008	**2008-2009**
$100,000	$100,000

Authorize TEA/SBEC to establish a Technology Applications Supplemental Endorsement and approved training programs with state reporting requirements to hold districts accountable for progress of teachers toward acquiring teacher technology competencies.

Current Funding $0

2007-2008	**2008-2009**
$250,000	$100,000

Fund stipends for Master Technology Teachers as detailed in TEC 21.242(e).

Current Funding $0

2007-2008	**2008-2009**
$750,000	$1,000,000

Economy and Efficiency

Fund statewide access to the Texas Library Connection resources for equity and for leveraging economies of scale.

Current Funding $0

2007-2008	**2008-2009**
$4,000,000	$4,000,000

Continue discounts of WAN connectivity and expand the eligible services to include larger bandwidth transport services to all regions.

Fund a statewide broadband PreK-12 education backbone infrastructure to support growth of Internet usage, electronic textbooks, simultaneous testing, virtual schooling, and professional development delivered via online and other distance learning technologies and demanding applications.

Current Funding $0

2007-2008	**2008-2009**
$1,000,000	$500,000

Develop and require state data standards for all district applications required by the state or funded with state funds to meet interoperability and accessibility requirements.

Current Funding $0

2007-2008	**2008-2009**
$100,000	$100,000

For many years, funding was appropriated for implementation of the Long-Range Plan for Technology. The amount ranged from $13.9 million in 1996 to over $16 million in 2002 and was usually paid from the Telecommunications Infrastructure Fund. This funding was eliminated in the 2003 legislative session.

APPENDICES

History of Technology Planning in Texas

History of Instructional Materials and Digital Content

Timeline of Events and Accomplishments of Technology Planning in Texas

Study of Needs That Will Enable Schools to Achieve Target Tech

State Educational Technology Funding Chart Data

Ratio of Students Per Computer

Internet Bandwidth (Sample)

Technology Allotment to Support and Sustain Advanced Tech

Infrastructure and Related Technical Support

Technology Allotment to Support and Sustain Target Tech

No Child Left Behind Act of 2001, Title II D Enhancing Education Through Technology

National Educational Technology Plan

Glossary

Publication Order Form

The History of Technology Planning in Texas

States across the nation traditionally looked to Texas as a leader in educational technology. A visionary plan and an impressive array of technology initiatives earned Texas this leadership position. In 1985, in accordance with State legislation, the State Board of Education (SBOE) developed a long-range plan for the use of technology in education. The plan was adopted in 1988. Texas was one of the first states in the nation to adopt such a visionary plan.

The original Long-Range Plan for Technology (LRPT) covered the years 1988-2000. At that time, the Texas economy demanded an educated workforce, and the plan explained how education, technology, and the economy are interdependent. The internationalization and competitiveness of the economy required an educated Texas; the economic sectors in Texas were changing, and technology pervaded the economy. The plan further explained how too many Texas students were failing to graduate from high school, causing personal and economic hardship, social repercussions, and demographic developments which would increase the costs to the state.

Texas legislation required a long-range plan for technology. Technology was needed to meet the mission of quality, equity, and accountability as outlined in the over-arching *Long-Range Plan of the State Board of Education for Texas Public School Education.* The 1998 LRPT provided a vision of education on the frontier of the 21st Century.

Original Plan

The original LRPT was built on the foundation that basic skills can be acquired thoroughly and more quickly with the use of technology; higher-order skills can be improved with the use of technology; technology can help meet the needs of students with disabilities; distance learning is a proven means for providing instruction and in-service; and a statewide telecommunications network can improve communications and information exchange at reduced costs. The plan acknowledged that education would be characterized by a variety of uses and levels of implementation, but all districts were expected to exhibit minimum attributes of technology uses that included:

1. Student Workstations
2. Teacher Workstations
3. Administrator Workstations
4. Open-access Learning Centers
5. Telecommunications Centers

The implementation of the plan required sufficient hardware, challenging courseware, staff training, delivery systems, and research and development. As a result of the 1988 plan, and funding by the Texas Legislature, several statewide technology initiatives were implemented.

These included:

- The Texas Education Network (TENET)—established to provide electronic communication among educators.
- The T-STAR Network—provided television communications (one-way video/two-way audio via satellite) opportunities to more than 1,000 school districts, all 20 regional Education Service Centers (ESCs), and the Agency.
- The Texas Center for Education Technology (TCET)—established to serve as a K-12 technology and educational research and development center.
- Technology Preview Centers and Training Programs—established at the twenty ESCs to provide school districts with educational technology services that enhance efficiency, effectiveness, and the performance of students, teachers, and administrators.
- Technology Demonstration Programs—established to investigate the uses, effectiveness, and feasibility of technologies for education and to provide models for effective education using technology.
- The Texas Educational Telecommunications Network (TETN)—established to provide two-way videoconferencing and data exchange between TEA and the 20 ESCs. Regional networks were created which link school districts for videoconferencing and Internet access.
- The Texas Library Connection (TLC)—established to ensure that all citizens of its school communities were provided current and relevant information resources regardless of a district's size or geographic location. Through enrollment in TLC, Texas students and educators had free 24/7 access from their school library, classrooms, and homes to a wide variety of information, including a catalogue of more than 5,000 school library holdings encompassing more than 50 million items.
- The Advisory Committee on Technology Standards (ACTS)—appointed to develop standards for technology planning in Texas schools.
- The Software Advisory Committee (SAC)—appointed by the State Board of Education (SBOE) to adopt criteria and standards which districts could use to ensure that software and courseware they purchased met minimum criteria for quality and functionality.
- The ACTS and SAC—integrated to form the Educational Technology Advisory Committee (ETAC) to work in an advisory capacity to increase the equity, efficiency, and effectiveness of student learning, instructional management, professional development, and administration through the effective use of educational technology.

History of Instructional Materials and Digital Content

The State Board of Education is charged with ensuring that every student in Texas has access to high quality instructional materials that are aligned with the Texas Essential Knowledge and Skills. The textbook adoption process in Texas is widely acknowledged as among the best in the nation. It ensures that students have the materials they need to meet curriculum expectations and state accountability measures. In 1987, The Texas Legislature amended the definition of a textbook to include "computer software". Now, virtually every state includes software and digital content in their definition of textbooks or instructional materials. The original Long-Range Plan for Technology approved in 1988, encouraged the modification of textbook laws, processes and procedures to support the adoption and delivery of an Electronic Instructional Media System (EIMS). In 1990, the State Board of Education adopted the first-ever EIMS with "Windows on Science", a videodisc-based elementary science program from Optical Data. Two years later, the SBOE adopted EIMS for computer literacy as well as seventh grade science and chemistry. For computer literacy, only electronic materials could be submitted. In

addition, changes were made to textbook rules and procedures to encourage the submission of electronic materials.

In 1995, the Texas Legislature amended the definition of a textbook to include an electronic textbook. "Electronic textbook" means computer software, interactive videodisc, magnetic media, CD-ROM, computer courseware, on-line services, an electronic medium, or other means of conveying information to the student or otherwise contributing to the learning process through electronic means."

During the late 1990's, a Computer Network Study was conducted to explore the potential of computer networks for the delivery of instruction. A subcommittee also examined the options for accessible materials for students with disabilities. The following benefits and impact of using computer networks in schools were documented in the 1999 report.

Technology Impact in Education

According to research data and practitioners, technology use has had a significant positive impact on teaching, student performance, attitudes and behaviors, and on administration. Benefits associated with the use of computer networks, including the Internet, range from enhancing the learning environment; exposing students to a wider array of information; making learning more student-centered; transforming students into engaged and independent learners; improving students' academic performance, including their performance on standardized tests; improving student retention and job placement skills; and preparing students for the future.

Technology Use and Integration – Electronic Delivery of Content

➢ Technology use in Texas public schools is increasing and technology integration is emerging. Data show that teachers and students use the Internet as part of regular classroom instruction and that the rate and frequency of usage are increasing.

➢ Although commercially developed electronic instructional materials are still primarily used in the computer lab rather than in individual classrooms, use at the classroom level is expected to increase with increased connectivity and access to computers by teachers and students. Likewise, the delivery of instructional materials through computer networks is expected to increase with increased connectivity at the classroom level and increased access to computers by students and teachers. In addition, increased use of instructional materials via computer networks is expected as teachers gain experience in technology integration.

➢ Accessibility of products and information for individuals with disabilities has become a worldwide issue. Schools now provide a wide range of assistive technology to students with disabilities. Special content and modified tests are offered and teachers, students, and parents are trained in the use of technology. Texas provides Braille, large type, and audiotape versions of many state-adopted textbooks and with the advent of new technologies, tools, and expertise, it is now possible to design electronic textbooks that are accessible to all users. When accessibility is designed into the textbook itself, learning activities can be customized, not just for students with disabilities, but for all students. In this way, the benefits accrue not just to those who most urgently need these accommodations but to mainstream learners as well.

- ➢ Based on research conducted by the Accessibility Subcommittee, preliminary estimates of the additional cost to electronic textbook publishers for producing accessible CD-ROM and Web-based textbooks is 2.0-2.5% over the cost of producing non-accessible versions.

- ➢ To ensure that the electronic textbook is designed in the most logical and cost-effective manner to be accessible to all students requires collaboration among textbook publishers, media accessibility developers, software and hardware developers, teachers of students with disabilities, consumer advocates, Internet and online service providers, and state government.

Many of the benefits of technology use as reported in the Computer Network Study are now being realized in Texas classrooms. With increased connectivity and availability of accessible products and information for students with disabilities, Texas students have access to many electronic instructional materials and resources. Often, print textbooks are also accompanied by a CD-ROM version and/or web-based materials. These electronic versions offer added features such as interactivity, glossaries, other languages, simulations, and links to internet resources. Teacher resources often include websites and electronic tools as well. In 1999, pilot projects were conducted to further explore the use of technology in the classroom. TEA conducted educational technology pilots at 13 sites that represented a cross section of Texas elementary, middle and high schools across the state. The primary objective of these pilots was to examine the effectiveness of using various technologies to deliver substantial curriculum content to students and to improve student learning.

The pilots examined the cost and efficacy of using technology to deliver curriculum that has traditionally been delivered through print media. The pilots were used on various technologies and involved hardware and curriculum products from numerous vendors.

The recommendations from the 1999-2000 Ed Tech PILOTS were guiding factors in establishing four new pilot projects in the fall of 2001 in foundation curriculum areas of Reading, Math, Science and Social Studies. The general purpose of these projects was to use technology to more effectively deliver student performance data, curriculum content or professional development to classroom teachers. All projects employed a web interface as a focal point for delivering this content. Each of the Ed Tech PILOTS established partnerships that included the Texas Education Agency, content area centers for professional development, existing state initiatives, universities, and technology vendors. Each of these pilots provided valuable insights regarding the use of technology in the classroom. While there is considerable potential for positive impact on student success, the primary challenge to expanding technology integration and use is sustained funding.

In 2001, Texas issued a proclamation for instructional materials for K-12 Technology Applications with an emphasis on electronic delivery. The SBOE created a subscription-based pricing model to encourage submission of online content. Over 80 products were submitted and the majority included electronic components. Technology Applications instructional materials were adopted in 2003 and included products from 17 publishers. The subscription-based pricing model required modifications to various processes for both publishers and the agency. Subscriptions are renewed annually based on student enrollment.

The SBOE adopted instructional materials that included CD-ROM and web-based versions in content areas such as language arts, and social studies in 2002. In 2003, Technology Applications materials were adopted as well as electronic components in foreign languages, bilingual education, and fine arts. Proclamation 2004 materials for secondary math were reviewed in June 2006. They included 14 electronic and/or online products for student use and many teacher editions included electronic components.

With the increase in the type and quantity of electronic instructional materials now on the market, new terms are emerging to describe these materials.

> Digital content – usually refers to materials that include embedded links to external sources; media elements such as audio, video, graphics, animation, and simulations; embedded tools such as a calculator, survey or spreadsheet; technologies that evaluate student responses and provide content related to student needs; is easily updated and enriched; can be tagged to facilitate searching, sorting and selecting; and is often available in modules as well as a full course of study. Content may be easily accessed by curriculum management systems to track student progress.

> Electronic textbook or e-book – usually refers to an electronic replica of a print textbook (PDF or html) and is typically available for a full course of study. Typically cannot be easily accessed by curriculum management systems to track student progress.

To expand the opportunities for digital content in the adoption process, the State Board of Education has amended TAC Chapter 66 rules. Changes include the options for updates, revisions and substitutions as well as subscription-based pricing.

Funding

Funding for educational technology is key to the Texas schools' ability to implement the LRPT. Texas schools have continued to receive the Technology Allotment, which has provided approximately $30 per student per year since it was implemented in 1992. Although this allotment was envisioned as a fund that would increase over time, the Technology Allotment continues to provide approximately $30 per student per year. Technology Allotment funds may be used for electronic instructional materials, access to electronic instructional materials, and professional development in the use of electronic instructional materials.

The Telecommunications Infrastructure Fund (TIF), established in 1995, provided grants to K-12, higher education, public libraries, and health care facilities for the development of the technology infrastructure. Most K-12 schools received funds for Internet access and/or distance learning through TIF grants. TIF grants to schools were eliminated in 2003 but the Technology Allotment is now funded by the Telecommunications Infrastructure Fund.

1996 Plan

In response to changes in legislation, business, industry, and developments in technology, a new plan was adopted by the SBOE in 1996. *The Long-Range Plan for Technology, 1996-2010* charts the course for providing all Texas students with access to quality educational opportunities through the use of technology. As education moved into the 21st Century, evolving technology continued to play a critical role in all aspects of society. The LRPT serves as the state's blueprint for putting cost-effective tools into the hands of Texas students, teachers,

librarians, and administrators. These tools enable educators to gain the knowledge and skills required for teaching, learning, and working in the 21st Century. This plan clearly establishes technology as an essential priority in ensuring that <u>all</u> Texas schools, regardless of their size, geographic location, or district wealth, have the ability to provide quality educational opportunities.

The fundamental goal of the *Long-Range Plan for Technology, 1996-2010,* therefore, is to enhance students' acquisition of knowledge through technology. Inherent in this priority goal is the conviction that technology, equitably distributed, plays a critical role in addressing economic and other disparities among students and is an important tool for meeting the needs of students with disabilities. The goal of the LRPT is reflected in four broad areas: Teaching and Learning, Educator Preparation and Development, Administration and Support Services, and Infrastructure for Technology. The goals for each of these four areas are:

Teaching and Learning: The students in the public education system will demonstrate technology proficiencies identified by the Texas Essential Knowledge and Skills and will have access to the technology tools, products, and information that support their acquisition of a quality education.

Educator Preparation: The teachers, librarians, counselors, and other educators in the public education system will demonstrate technology proficiencies identified by the State and will have access to the technology tools, products and information that facilitate their work and support student learning.

Administration and Support Services: The administrators in the public education system will demonstrate technology proficiencies identified by the State. Students, educators, administrators, parents, legislators, and community members will have access to the technology tools, products, and information they need to make decisions, to educate, to plan, and to learn.

Infrastructure for Technology: Technology tools, products and information appropriate for Texas schools will be accessible to the students, teachers, librarians, counselors, and administrators in the public school system via a comprehensive, integrated state technology system for voice, video, and data that is complemented by a human infrastructure of trained individuals who use and support technology.

Implementation

To meet these goals, ongoing programs have been implemented at the state, regional, and local level. The Texas Education Agency (TEA) provided leadership and support through a wide variety of technology initiatives that gave Texas students, parents, teachers, administrators, legislators, and business leaders access to the tools, products, and information they needed to make decisions, to educate, to plan, and to learn. Several Educational Technology Pilot Programs were conducted to explore the ways technology can be used to provide increased learning opportunities for Texas students. TEA statewide initiatives and policies were implemented to support and encourage the use of online and other distance learning to provide equitable access to educational opportunities for all students and educators. These technology initiatives collectively comprised the Public Access Initiative, which was the TEA's strategy for implementing the LRPT. The ESCs provided on-site and virtual Technology Preview Centers, offered a wide variety of technology professional development opportunities, assisted schools with planning for the use of technology, and built or expanded regional networks to deliver

voice, video, and data services to school districts. They offered for-credit courses for students. For educators, they offered continuing education and certification opportunities. As these initiatives were implemented, districts and campuses realized the benefits that technology brings to their classrooms and administrative offices. Today, districts have effective technology plans in place which support their campus improvement goals.

As required by law and in support of the goals of the Long-Range Plan, there is a state curriculum called Technology Applications. The state established expectations for technology proficiencies for students in Kindergarten through Grade 12 by adopting the Technology Applications Texas Essential Knowledge and Skills (TEKS). One credit in Technology Applications is required for all graduation plans. The Educational Technology Advisory Committee developed the Technology Applications standards and recognized that technology is integral to all content areas. As a result, ETAC members assisted other TEKS writing committees in infusing technology into all curricular areas at grades K-12 in a structured, organized, and systematic manner.

The *Long-Range Plan for Technology, 1996-2010* recommends the development of technology proficiencies for all educators. The State Board of Educator Certification (SBEC) approved educator certification standards in Technology Applications for all beginning educators. The Technology Applications standards are incorporated into the Texas Examination for Educators (TExES) for Pedagogy and Professional Responsibilities and are required for all beginning teachers in all certification areas for every grade level. The Technology Applications SBEC standards are based on the Technology Applications TEKS for students in grades 6-8. These standards were recommended for current teachers.

The 1999-2001 Educational Technology Advisory Committee (ETAC) developed and piloted the Texas STaR Chart, a tool for districts to use for planning and self-assessing **S**chool **T**echnology **a**nd **R**eadiness aligned with the *Texas Long-Range Plan for Technology, 1996-2010*. The Texas STaR Chart is designed to help campuses and districts determine their progress toward meeting the goals of the long-range plan. In 2004, the Teacher STaR Chart was added to the suite of technology planning tools available for measuring progress in meeting state and federal requirements and the impact of state and local efforts to improve student learning through the use of technology. In addition, the STaR Chart assists in identifying needs for ongoing professional development and raises awareness of research based instructional goals.

The STaR Chart includes four stages of progress: Early Tech, Developing Tech, Advanced Tech and Target Tech in each of the four sections of the LRPT. These sections are Teaching and Learning, Educator Preparation and Development, Administration and Support and Infrastructure for Technology.

The 2004-2005 Campus Chart indicates that the majority of districts were at the Developing Tech stage in all four of the key areas. Of the 7,422 campuses completing the chart, the Advanced Tech level received the second highest percentage in all key areas. Of the reporting districts, Target Tech was achieved by 4% or less in all of the key areas.

In 2005-2006, the highest percentage of the districts continued to be at the Developing Tech stage. An additional 180 campuses (7,602 total) completed the Campus STaR Chart as compared to the previous year (7,422). Of the 7,602 campuses completing the chart, the second greatest percentage was in the Advanced Tech area. Early Tech and Target Tech were both in the low percentages in all four key areas.

Campus STaR Chart

	Teaching and Learning		Educator Preparation		Administration and Support		Infrastructure	
	2005	**2006**	**2005**	**2006**	**2005**	**2006**	**2005**	**2006**
Early	7%	3%	5%	3%	2%	4%	2%	4%
Developing	69%	68%	66%	63%	65%	59%	65%	59%
Advanced	22%	27%	27%	32%	29%	34%	29%	34%
Target	2%	2%	2%	2%	4%	3%	4%	3%

2004-2005 - 7,422 Campuses
2005-2006 - 7,602 Campuses
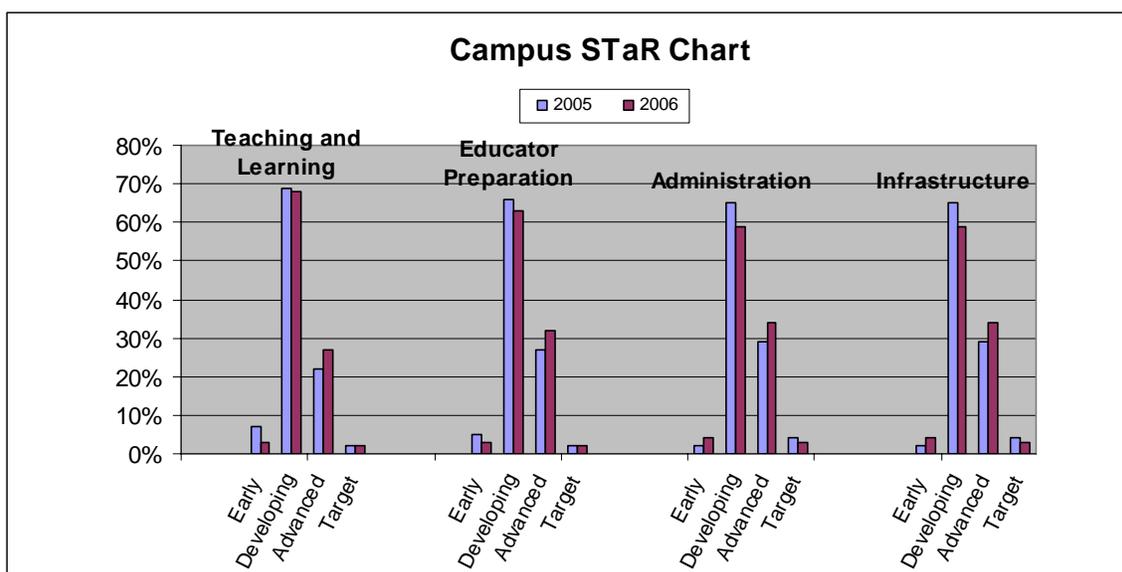
TEACHER STaR CHART

The 2004-2005 Teacher STaR Chart benchmark year indicated similar results of the Campus Chart. Of the 172,039 teachers completing the chart, the largest percentage indicated Developing Tech level in all four of the key areas. The teacher percentages also followed the campus percentages with Advanced Tech level as the second largest percentage in all key areas with one exception, the Teaching and Learning area had early tech as the next highest percentage. Target Tech, the lowest percentage, was 6% or less in all key areas.

The 2005-2006 school year Teacher STaR Chart indicated that 172,783 teachers completed the chart. Again the results were consistent with the 2004-2005 chart. The greatest percentage of teachers indicated they were in the Developing Tech level of progress along with the second largest percentage in the Advanced Tech level. The Advanced Tech level showed improvement in two of the key areas in the 2005-2006 school year. When comparing the charts in the Early Tech level, the percentages have decreased in the Teaching and Learning and Educator Preparation areas and had a slight increase in the Administration and Support and Infrastructure areas.

Teacher STaR Chart

	Teaching and Learning		Educator Preparation		Administration and Support		Infrastructure	
	2005	**2006**	**2005**	**2006**	**2005**	**2006**	**2005**	**2006**
Early	22%	15%	20%	12%	11%	17%	15%	26%
Developing	55%	56%	51%	52%	62%	52%	61%	46%
Advanced	18%	23%	24%	29%	23%	27%	22%	25%
Target	5%	6%	6%	7%	3%	4%	2%	3%

2004-2005 - 172,039 Teachers
2005-2006 - 172,783 Teachers
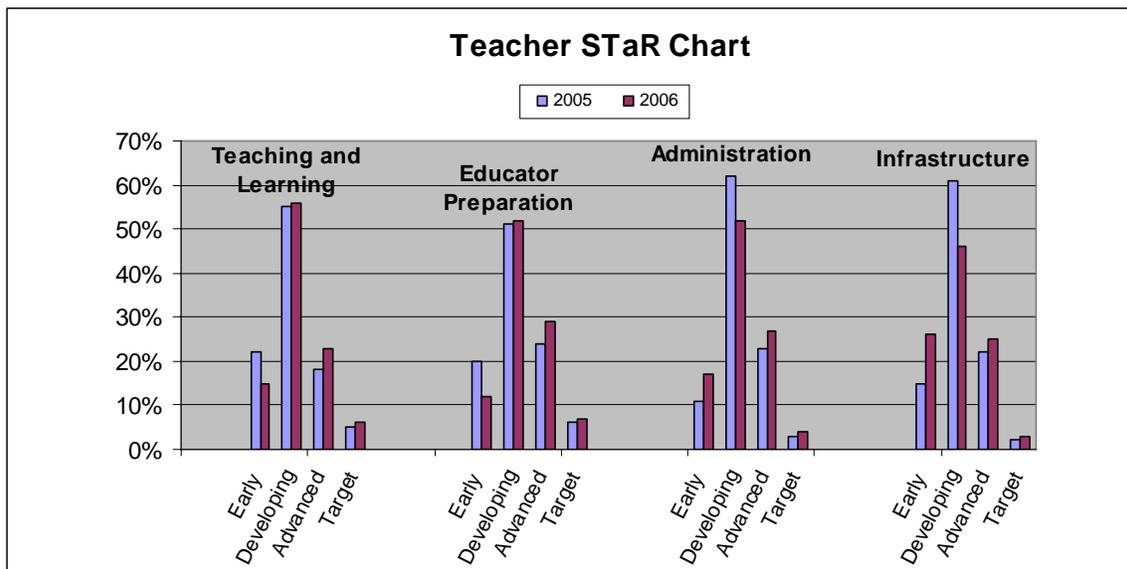
The ETAC, in collaboration with the Educational Technology Division of the TEA, developed the *2002 Update to the Long-Range Plan for Technology, 1996-2010* to align the state plan with the federal *No Child Left Behind Act of 2001*. The updated plan was presented to the 78th Texas Legislature in December 2002.

Another milestone in technology planning in Texas is the Texas ePlan System. This system was developed by the ETAC and the TEA Educational Technology staff in partnership with the South Central Regional Technology in Education Consortium (SCRTEC) housed at Southwest Educational Development Laboratory (SEDL) and the Technology Planning and E-Rate Support Center (TPESC) at ESC Region 12. This online planning system opened January 15, 2004, and allows districts to develop, update, and submit their district's technology plan in an online environment. All districts are required to submit their plan through the Texas ePlan System for review and approval to be eligible for technology funding through No Child Left Behind and the federal Universal Service Fund, commonly known as E-Rate. Plans may be approved for one, two, or three years and must be updated annually.

The 2004-2006 ETAC had a new and challenging charge—to develop a new Long-Range Plan for Technology. Members include national and state leaders in educational technology,

administrators, technology coordinators, principals, teachers, librarians, ESC personnel, and Agency staff. As a part of ETAC's work, the group reviewed the new *National Educational Technology Plan* released by the U.S. Department of Education in January 2005. States are now able to update their state plan to align with the new national plan. State eligibility requirements for Title II Part D of NCLB [SEC. 2413] include a new or updated statewide long-range strategic educational technology plan. This state plan should address the educational technology needs of local education agencies that also are required to have an updated plan to qualify for Title II Part D funds as well as E-Rate discounts. To ensure that Texas is well prepared to meet this requirement, ETAC is developing a comprehensive planning strategy that includes this new *Texas Long-Range Plan for Technology* that spans from 2006-2020. In addition, ETAC is developing corresponding updates to the state's current planning tools provided for districts including the Teacher and Campus STaR Charts and the online Texas ePlan system. The timing is perfect to develop this new *Long-Range Plan for Technology, 2006-2020* as the current plan, developed in 1996, is now ten years old.

Timeline of Events and Accomplishments of Technology Planning in Texas

September 1984 - August 1988
- The Long-Range Plan of the State Board of Education for Texas Public School Education, 1986-1990 required a long-range plan for technology
- HB 1304 called for long-range plan for technology
- HB 246 mandated a computer literacy course at Grades 7 or 8
- Software Advisory Committee (SAC) established
- The State Board of Education (SBOE) established essential elements for Computer Literacy and Computer Science (TAC Chapter 75). Computer Literacy was a required course. Computer Science was included in the Advanced High School program. The requirement to teach these courses included the Information Processing Technologies (IPT) for the Computer Literacy Endorsement and Computer Information Systems (CIS) for the Computer Science Certification.
- Developed the Long-Range Plan for fostering computer literacy among public school students so that by 2000 each high school graduate has computer-related skills (TEC §32.001)

September 1988 - August 1990
- The *Long-Range Plan for Technology, 1988-2000* was adopted by the SBOE
- SB 650 authorized statewide initiatives defined by the *Long-Range Plan for Technology, 1988-2000*
- SB 1 established the Technology Allotment of $30 per student per year
- Technology Preview Centers and Training Programs established at Education Service Centers (ESCs)
- Textbook adoption process amended to include electronic media
- First Technology Demonstration Sites established
- Advisory Committee on Technology Standards (ACTS) established by SBOE
- Texas Center for Educational Technology (TCET) established at the University of North Texas

September 1990 - August 1992
- First electronic textbook adopted by the SBOE
- Textbook Proclamation 68 called for only electronic textbooks to be submitted for computer literacy
- Texas School Telecommunications Access Resource (T-STAR) established to provide districts with satellite-delivered learning opportunities from providers across the country, as well as educational programming and information from TEA
- Texas Education Network (TENET) established
- TENET Master Trainer program established
- SAC recommended use of *The Educational Software Selector* (TESS)
- SB 351 included technology funds in the Foundation School Program
- Districts required to submit five-year technology plan to TEA and the Department of Information Resources (DIR)

- TEA reviewed over 1000 technology plans
- Initial Technology Allotment funds flow to school districts ($30 per student per year)
- State technology funds supported ESC Technology Preview Centers and Training Programs

September 1992 - August 1994
- SB 7 included technology planning in campus and district improvement plans
- SAC and ACTS combined to form the Educational Technology Advisory Committee (ETAC)
- SB 5, Rider 61, called for development of a statewide database of school library holdings
- HB 183 and HB 1029 called for establishment of technology demonstration sites - Projects for Educational Technology (PETs)
- First eight Centers for Professional Development and Technology (CPDTs) established
- First TEA programs for Texas schools broadcast from William B. Travis building over the T-STAR Network
- T-STAR Information and Training Center established
- TENET website created
- A computing proficiency credit, now known as the Technology Applications credit, included in the Advanced and Recommended high school graduation plans

September 1994 - August 1996
- Texas Library Connection (TLC) established
- Tri-state Multimedia Project (*Vital Links*) released
- Texas Educational Telecommunications Network (TETN) – two-way interactive videoconferencing network linking all 20 ESCs and TEA established
- HB 2128 established the Telecommunications Infrastructure Fund (TIF) and provided discounted telecommunications rates to Texas public schools
- ETAC members charged with writing the Texas Essential Knowledge and Skills for the Technology Applications curriculum area
- Creating Connections Consortium designated as demonstration site under PETs
- Goals 2000: Educate America Act called for state planning to improve student achievement by integrating technology into curriculum
- Texas Education Code designated Technology Applications as a required enrichment curriculum (TEC §28.002)
- Final T-STAR grants awarded for purchase and installation of satellite dishes at districts across the state, bringing statewide total to 1,054
- T-STAR Studio B established, providing two-way videoconferencing facilities able to connect with other facilities across the country
- Technology Allotment moved to the Textbook Fund
- Texas Task Force on Educational Technologies established to develop the *Long-Range Plan for Technology, 1996-2010*

September 1996 - August 1998
- The *Long-Range Plan for Technology, 1996-2010* adopted by the SBOE
- Public Access Initiative established to implement the *Long-Range Plan for Technology, 1996-2010*
- Texas Education Agency website established to provide educators, legislators, and community members with immediate access to education data and services
- Technology Integration in Education (TIE) federal grant program provided $48.8 million to 57 local education agencies impacting over 600 districts

- SBOE adopted amendments to TAC Chapter 74 Curriculum Requirements to include all the newly adopted Technology Applications courses developed with the TEKS for graduation credit for all plans beginning the 1997-1998 school year
- For Year 1 of the E-Rate program, TEA reviewed 812 technology plans from districts
- Financial support of TENET phased out

September 1998- August 2000

- Adopted Texas Essential Knowledge and Skills (TEKS) for Technology Applications, Grades K-12 (TAC Chapter 126); became effective September 1, 1998
- Technology Summit held at the capitol to showcase the use of technology in Texas schools and the latest from technology and software providers
- Report submitted to the Texas Legislature with recommendations from the Computer Network Study Advisory Committee
- House Bill 1, Article III, Rider 70 funded by the 76th Legislature provided $1.85 million for the 2000-2001 biennium for resources for school libraries
- The Educational Technology Coordinating Council (ETCC) convened
- Thirteen sites selected as EdTech PILOTs to study the delivery of curriculum content to students via technology
- 1999 TIE grant program awarded $33.3 million to 32 local education agencies, impacting 419 entities
- The TLC Information Center established at ESC Region 20 for the purpose of ensuring that all citizens of Texas school communities are provided the information and skills to effectively use information resources available through TLC
- ETAC charged to develop a self-assessment tool for districts to gauge progress in implementing the Long-Range Plan for Technology
- T-STAR programs received two awards from the Texas School Public Relations Association (TSPRA)
- Rollover to the year 2000 (Y2K) completed successfully with no interruption of TEA services due to Y2K issues
- Centers for Educator Development for Reading and Language Arts, Mathematics, Science, Social Studies, Bilingual Education, Fine Arts, Languages Other Than English, and Technology Applications provide websites containing numerous resources for teachers to use to implement the TEKS
- 2000 TIE grant program awarded $33 Million to 25 local education agencies, impacting 258+ entities
- Installation of ATM equipment for TETN started
- SBEC approved educator certification standards in Technology Applications for all beginning teachers and teachers who want to be certified in Technology Applications (Technology Applications EC-12, 8-12; Computer Science 8-12)

September 2000 - August 2002

- No Child Left Behind Act of 2001 (NCLB) Title II, Part D of NCLB, Enhancing Education Through Technology, provides assistance to local education agencies for the implementation and support of a comprehensive system that effectively uses technology in elementary and secondary schools to improve student academic achievement
- HB 1475 created a Master Technology Teacher certification
- SB 975 directed the commissioner to implement a pilot program under which a school district may offer electronic courses to students primarily through the Internet and in which a student enrolled in a course is not require to be physically present in the classroom for all or part of the course

- ETAC developed the Texas School Technology and Readiness (STaR) chart to assist districts with technology planning
- Textbook Proclamation 2001 called for instructional materials for Technology Applications grades K-8 and high school courses that include Computer Science, Desktop Publishing, Digital Graphics/Animation, Multimedia, Video Technology and Web Mastering. To encourage the submission of electronic instructional materials, subscription-based pricing included for the first time as part of the adoption for Technology Applications materials.
- The Texas Library Connection reached 5,578 school libraries
- Pilot Programs established, including the Virtual School Pilot (VSP), Investigating Quality of Online Courses (IQ Pilot)
- Ed Tech Pilots established in reading, math , science and social studies
- T-STAR CPE Online established to help Texas educators meet certification requirements
- The Educational Technology Advisory Committee asked to update the *Long-Range Plan for Technology, 1996-2010* to align with NCLB

September 2002 - August 2004
- *2002 Update to the Long-Range Plan for Technology, 1996-2010* adopted by the SBOE
- Texas ePlan System developed to allow districts to create, edit and submit technology plans online
- Instructional materials adopted by the SBOE for Career and Technology Education, Fine Arts, Languages Other Than English, and Technology Applications included online and other technology-based products
- Technology Applications Readiness Grants to Empower Teachers (TARGET) grants awarded $50 million to 62 applicants impacting 545 districts
- Target Tech Center established at ESC Region 10 to provide assistance to districts receiving funds from NCLB Title II, Part D Enhancing Education Through Technology program
- SB 396 established the Technology Immersion Pilot (TIP) project
- SB 1108 called for a program to examine state policies, requirements and restrictions related to electronic courses (online learning)
- Subscription-based Technology Applications instructional materials adopted by SBOE for Grades K-12; scheduled to be in schools in 2004-2005; due to budget shortfalls, postponed a year pending legislative appropriations
- Telecommunications Infrastructure Fund (TIF) Board eliminated and grant program ended
- Funding for all TEA statewide technology initiatives eliminated
- T-STAR, TLC and IQ Pilot programs eliminated
- TEA reorganization and reduction in force eliminated the Educational Technology Division and integrated remaining three staff members into the Curriculum Division
- Funding for Technology Preview Centers and other educational technology services provided to schools by regional ESCs eliminated
- TEA received $1.9 million federal Evaluating State Educational Technology Projects (ESETP) grant to evaluate the TIP project
- $14.5 million in Title II D funds awarded to implement TIP
- Technology Planning and E-Rate Support Center established at ESC Region 12
- Texas Campus STaR Chart completed by 7,186 campuses
- Texas Teacher STaR Chart released in August 2004

September 2004 - August 2006

- ETAC charged with developing a new Long-Range Plan for Technology, 2006-2020
- Technology Applications Texas Essential Knowledge and Skills (as well as other enrichment TEKS) are now "required" when providing instruction, rather than being "guidelines"
- Technology Immersion Pilot (TIP) impacts over 19,000 students and 1400 teachers
- No Child Left Behind Title II, Part D Requirements—all students must be technology literate by the end of 8th grade and technology must be fully integrated into curriculum and instruction by December 31, 2006—are aligned with Technology Applications Texas
- Essential Knowledge and Skills (TEKS) and Technology Applications State Board for Educator Certification (SBEC) Standards I-V
- National Educational Technology Plan, 2004 released
- Electronic Course Pilot (eCP) established to implement SB 1108 (TEC 29.909)
- Education Technology and Textbook Division combined to form the Instructional Materials and Educational Technology Division
- TAKS-aligned version of the Algebra I end-of-course examination offered exclusively online
- The *School Library Programs: Standards and Guidelines for Texas* were adopted on May 16, 2005, by the Texas State Library and Archives Commissioners in consultation with the State Board of Education. The revised standards establish guidelines for school library programs at four levels: exemplary, recognized, acceptable, and below standard.
- Technology Applications subscription-based materials available to schools fall 2005
- More than 43,000 students and 5,000 teachers participated in NetDay 2005
- Technology Applications Teacher Network event expanded to a full-day prior to the beginning of the 2006 Texas Computer Education Association's annual conference. More than 500 teachers participated in 80 sessions.
- Texas schools and libraries received more than $329,065,536.65 in E-Rate discounts for Year 2004-05 and more than $170,313,754 in discounts for Year 2005-06 bringing the total to over $1.8 billion since the program started
- In 2006, Texas ESCs are providing two gigabits of Internet access, a three-fold increase over 2002 when they provided one-half a gigabit of Internet access.
- HB1 extended the TIP project to 2011
- TIP Continuation grants awarded to middle schools participating in the federal evaluation study
- ETAC developed the draft Long-Range Plan for Technology, 2006-2020 for consideration by the SBOE
- Updates to technology planning tools, including the Campus and Teacher STaR Charts and Texas ePlan System are underway

Study of Needs That Will Enable Schools to Achieve Target Tech in Texas

In an effort to gauge the current status of educational technology implementation and the ability of districts to meet the goals of the *Long-Range Plan for Technology, 1996-2010* educational technology leaders statewide were surveyed and provided valuable input. Additional data was reviewed and analyzed from a variety of sources, including summaries of the School Technology and Readiness (STaR) charts, the state provided tools for campuses and districts to self assess where they are with technology implementation. Data was also analyzed from *Education Week's* Technology Counts longitudinal reports; the *2002 Update to the Long-Range Plan for Technology, 1996-2010*; the Telecommunications Infrastructure Fund data; the TEA Web site data; and other sources. The *National Education Technology Plan 2004* also provided valuable insights and support.

The committee has identified the elements that are essential to building and maintaining 21st Century learning environments and to developing students who are capable of competing in a global economy. The most important of these elements is a cohesive partnership between the state and local educational agencies, regional Education Service Centers, and higher education to provide the administrative and instructional support, infrastructure, professional development, certifications, and progress measures required to equip teachers and students with 21st Century skills. Ultimately, the long-term health of the state economy depends on the investment that is made in students today. With dedicated state funding for technology combined with local funding, leadership, and vision, Texas will continue to lead the nation in effectively utilizing technology to meet the unique educational needs of all students.

In order for Texas to recover from the downturn in technology funding and regain its momentum and national leadership position in the area of educational technology, the following four areas must be addressed: dedicated technology funding; leadership and support; accountability; and economy and efficiency.

Many of the barriers that currently exist to implementing the recommendations of the *Long-Range Plan for Technology, 1996-2010* involve the lack of adequate funding for administrators and educational technology staff to fully address their students' educational needs. District leaders expressed an enthusiasm for implementing and integrating technology resources into and throughout their schools, but they expressed frustration with not being able to do so due to budgetary constraints. Districts across the state have felt the significant loss of educational technology funding that has occurred in the past few years. As a result, they are now seeing their technologies coming to the end of their life cycles with very few resources to replace or upgrade them. Professional development resources have diminished as well, and technical support and infrastructure have been hard to maintain. Loss of funding from state resources has been significant. Funding from federal resources is tenuous and has also diminished significantly in recent years.

State Educational Technology Funding

Based on the 2002 Update to the Long-Range Plan for Technology, TEA Data, and TIF Data

Legend:
- TETN
- TCET
- TENET
- Ed Tech Pilots
- T-STAR
- Texas Library Connection
- Technology Preview and Training Centers
- School Library Services
- Public Access Initiative
- Telecommunications Infrastructure Fund
- Technology Allotment

Years: 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005

After losing funding from the Telecommunications Infrastructure Fund (TIF), the technology and infrastructure in many districts is aging rapidly. Most districts will not be able to maintain their current level of technology and technology integration using only the Technology Allotment and local resources.

Sustainable and forward-thinking funding is needed, especially when more applications of technology are being recommended including: online testing, electronic textbooks, Internet2, online and other distance learning technologies, increased use of online reference databases, and digital libraries. Districts wholeheartedly support these expansions of appropriate technology uses and recognize the educational benefits. However, these resources require additional funding. Although most current infrastructure may be adequate to meet minimum standards for today's implementations, most infrastructure is not ready for massive increases in usage due to future demands required by electronic textbooks, simultaneous testing, virtual schooling, and other demanding applications.

Without significant, dependable, dedicated amounts of state funding, replacement cycles for technology will be extended beyond the useful life of the equipment, staffing will have to be cut, instructional support will have to be reduced, access to electronic resources will be limited, and educational technology will revert to pre-21st Century implementations.

The Technology Funding from state sources has declined in the past two years to levels that are below the level of funding provided in the mid 1990s.

Districts are attempting to implement 21st Century skills with 20th Century funding.

Priority Needs

Dedicated Technology Funding

The current dedicated technology funding is in the form of the Technology Allotment that has remained at the same approximate $30 per student level originally set in 1992. In 2005-2006, the allotment was decreased to $115,000,000 or $27.14 per student in average daily attendance. Without "dedicated" funding for technology, districts are under tremendous pressure to find funds for technology because of such tight funding that already exist for all the other educational programs. Significant and "dedicated" funding is necessary to maintain what has already been accomplished in Texas and to (1) improve the student-to-computer ratio, (2) provide instructional support and professional development, and (3) ensure adequate technical support, so that Texas can move forward into the 21st Century.

Students-to-Computer Ratio

Improvement in the Students-to-Computer Ratio has actually stalled in Texas according to the Technology Counts annual report of *Education Week* from 3.3 students-to- computer in May 2003 report to 3.4 students- to-computer in May 2006. With more instruction being based on use of technology and the student-to-computer ratio stalling at 3.4 students per computer, student access to computers is actually worsening rather than improving.

Ratio of Students to Computer
Based on Education Week Surveys and Projected Obsolescence

☐ Ratio of Students to Computer
■ Ratio of Students to Computer Adjusted Based on 50% Obsolescence Factor
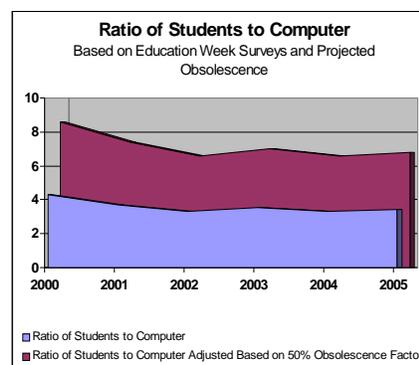
Also highlighted in the report is the number of what could be considered obsolete computers, or those that are not running current operating systems. Obsolete computers range from 37%-66% each year. Other research has indicated in the past that up to 52% of computers nationally should not be calculated into the student-to-computer ratio because they are obsolete. Taking obsolescence into account, the true student-to-computer ratio in Texas schools would be much greater than the 3.4 to 1. Percentages of obsolete computers will most likely accelerate as well due to the fact that computers will be kept past their useful life because there is no money to replace them.

The Telecommunications Infrastructure Fund (TIF) grants provided telecommunications infrastructure and some computers for schools. However, with the loss of the TIF grants, local dollars that could have provided computers for schools are now being diverted to replace the funding support for the telecommunications infrastructure of schools. With the loss of TIF, and based on the reports that were received from educational technology leaders throughout the state, a conservative estimate would anticipate that the trend of increasing the student-to-computer ratio that began in 2002-2003 will continue to stall. This indicates that sustainability has <u>not</u> been reached and that the numbers of computers added each year are not enough to keep up with the student population growth and demands for access. Funding new computers to keep up with the student population growth will require more than the $27.14 per student Technology Allotment each year even when combined with the districts' limited ability to provide local funding.

A significantly larger allotment is needed to help districts provide students with the access to the technology and instructional resources essential to learn and work in the 21st Century.

Technical Support

Most business models address technician support at approximately 100-150 workstations per technician. The Educational Technology Advisory Committee also recognizes that the technical support needed for maintaining the vast amount of technology necessary to immerse districts with technology resources will never be able to be funded at the level that business provides. The Texas STaR Chart committee, recognizing this fact, only set as a goal for Target Tech a ratio of 350 workstations per technician. As computers and technology are added to a district, the total cost of ownership has to include an increased number of technicians to maintain and service the equipment. As the technology ages, technical support demands increase. Technical support is essential to sustainable immersion of technology in schools and should be provided for as "dedicated" funding in both state and local technology budgets.

Due to the integration of technology into all facets of education, the need for bandwidth is growing exponentially. With this growth comes all of the associated costs for the additional bandwidth itself, the hardware and software upgrades, and the technical staff to manage it. Adding to the technical support challenges are the denial of service attacks, increased SPAM, viruses, hackers, worms, illegal online activity, increased sophistication of servers, routers, telecommunications services and hardware, and other technical issues that increase the demands for districts

Internet Bandwidth Usage Growth
Example Based on Sample of ESC Regional Networks
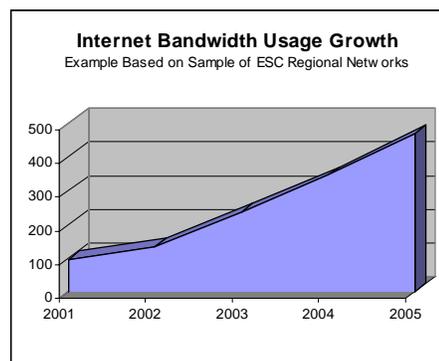
to provide sophisticated district-level technical support. In addition, the expanded use of the networks by students, teachers, administrators, and parents for video-streaming, teleconferencing, online and other distance learning technologies, 24/7 access, online student and district records, communications with parents, and much more require that districts provide sophisticated district-level staff to provide technical support and expertise. Disaster recovery planning and support is also critical to ensure the access to essential technology and communications services in case of an emergency.

Professional Development

The *Long-Range Plan for Technology, 1996-2010* also recognizes the importance of professional development. It therefore establishes that a standard of 30% of a district's technology budget be devoted to professional development. The STaR Chart also sets this standard as the Target Tech level that districts should attempt to reach. The NCLB Title II Part D funding emphasizes a similar standard by requiring that 25% of federal Title II Part D technology formula and grant funds be dedicated to professional development. To maximize the state's and district's investments, professional development must be sustainable, ongoing, high quality, and accessible 24/7; therefore, it must be provided for in the Technology Allotment and the local technology budgets. A comprehensive professional development initiative is imperative. With sustained leadership and support, this initiative can move teachers from Early or Developing Tech on the Teacher STaR Chart to Advanced or Target Tech. This initiative should be responsive to the needs of teachers by providing content-focused strategies and technology tools appropriate for each subject and grade level.

The ETAC recognizes that significant and "dedicated" state level educational technology funding is necessary in at least these three areas to allow districts to strive for and fund Target Tech level schools as defined in the Texas STaR Chart. Significant, dedicated, and on-going funding must be provided by the state in order for the state to benefit from its investment in educational technologies. Administrative support, instructional support, technology, infrastructure, technical support, instructional resources, professional development, and teacher competencies must all be addressed simultaneously to produce effective change, rather than piecemeal over time.

Short Term Priorities 2006-2010

Priority 1. – Dedicated Technology Funding for Advanced Tech:

Realizing that providing funding for the basic elements of student-to-computer ratio, technical support, and professional development alone, at the Target Tech level, may be beyond the reach of the state to provide, ETAC believes that dedicated technology funding should at least be provided in an amount that will give all districts in the state the opportunity to reach and sustain the Advanced Tech level on the Texas Campus STaR Chart in the three major cost areas of Student-to-Computer Ratio (4 students per computer), Technical Support (500 computers per technician), and Professional Development (25% of this technology allotment). To reach this level and to sustain these gains, the state and districts need to provide dedicated technology funding of at least $123 per student per year as minimum funding (see Appendix 4). A greater amount would allow districts to make strides toward the desired Target Tech. Even though this funding will only provide for these three major areas of technology immersion, it will form the foundation upon which technology can truly impact the instruction for all students in all districts, including elements that ensure equitable access to students with disabilities. The $123 funding level will only provide the 4:1 ratio based on a four-year replacement cycle of equipment and based on an average multimedia computer with associated cost of $1,200, but it establishes the minimal access for all students and also provides sustainability for that access. The technician support of 500 computers per technician is calculated into the $123 allotment based on a minimal annual cost of $35,000 per technician.

**Dedicated Technology Funding
To Allow Districts to Gain and Maintain
Advanced Tech**

- Student-to-Computer Ratio (4:1) — 61%
- Technical Support (500:1) — 14%
- Instructional Support/Professional Development (25%) — 25%
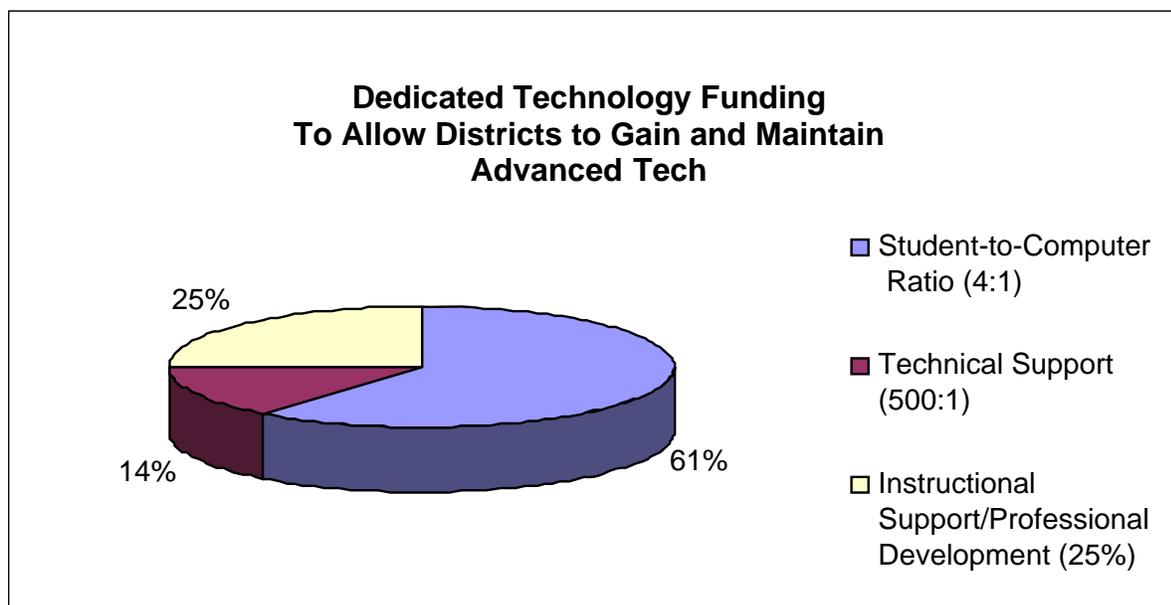
When determining the local share of the $123 per ADA, if any, the state needs to keep in mind that the local district must also provide resources beyond those covered by state funds, including:

- providing all teachers with the technology that they need to teach, including a 1:1 teacher-to-computer ratio, and presentation and other instructional equipment;
- software and licensing fees;
- printers, scanners, and other peripheral hardware and supplies;
- administrative support and planning;
- facilities and furniture;
- increased electrical and utility use;
- telecommunications and Internet access costs;
- internal network, servers, and infrastructure;
- distance learning equipment and resources; and
- other non-funded supplemental resources to complete the funding needed for a fully integrated program.

This makes the local district's share of funding educational technology a significant amount beyond these basic areas. To provide equity and sustainability, however, computers and technology require combined state and local "dedicated" sustained funding provided for in the state's dedicated technology funds and the local technology budgets. Technology has become a new and significant but basic operating cost for doing business in education. A dependable, sustained, ongoing, equitable funding mechanism must be put in place to fund it.

Priority 2. Infrastructure and Related Technical Support

As computers and technology converge and are added to a district, the investment has to include an increased number of technicians to maintain and service the equipment and software such as the servers, routers, switches, firewalls, storage, backups and recovery, e-mail, spam and content filtering, web hosting, wired and wireless connectivity infrastructure, security, telecommunications and Internet access, updates and upgrades, Intranet services, and more. In addition, the expanded use of the networks by students, teachers, administrators, and parents for digital data casting, video-streaming, teleconferencing, distance learning, 24/7 access, online student and district records, communications with parents, and much more require that districts provide sophisticated district-level staff to provide technical support. Disaster recovery planning and resources are also critical to school operations. As the technology ages, technical support demands increase. Infrastructure and related technical support is essential to sustainable immersion of technology in schools and should be provided for as "dedicated" funding in both state and local technology budgets. Dedicated funding to support infrastructure and related technical support is essential to maintaining access to the technology services districts rely on for administrative functions, instructional support, and communication with all stakeholders on a daily basis and in cases of emergency. A dedicated infrastructure and related technical support allotment of $35 per student is needed to provide these essential functions.

State Leadership and Support

Priority 3. Educational Technology Leadership and Support

In 2003, the Texas Education Agency was downsized and the Educational Technology Division, which had been the national leader in educational technology for many years, was eliminated as an independent division. TEA's Educational Technology Division has been an innovator over the years for a large number of programs and services to schools. The Educational Technology Division at TEA has also provided vision and leadership by developing and implementing the Texas Long-Range Plan for Technology. The division was downsized from approximately eighteen staff members to approximately three staff members who served in the curriculum division of TEA. Educational Technology was later combined with Textbook Administration, which became the Instructional Materials and Educational Technology Division. The current educational technology staff is fully funded by federal dollars under NCLB and is therefore limited in its ability to provide leadership for the state outside of that categorical funding. In addition, the Title II Part D funding was reduced by 28.3 percent for the 2005-2006 funding year and reduced in 2006-2007 by another 45%.

Likewise, the funding to the Education Service Centers' educational technology departments was completely eliminated and as such the services that ESCs provided have been eliminated or reduced to only those services that can be funded from local funds, federal grants, or provided at a cost now paid for by districts. Schools throughout the state need the leadership and support that they once received from TEA and their Education Service Centers. Also, due to these cuts, teachers are not receiving the quantity of professional development that was previously provided by the ESCs. ESCs were working to help districts prepare teachers to teach students 21st Century skills and were instrumental in assisting TEA with implementation of technology-related legislation statewide. Additionally, ESCs helped districts meet the standards of the Long-Range Plan for Technology, STaR Chart standards, technology planning standards, and other strategic endeavors.

ESCs have been valuable partners with TEA and school districts and are essential to Texas in implementing future technology related initiatives as well as providing training and professional development, technical support, resources, and infrastructure in the most economical and efficient manner.

The Educational Technology Departments at TEA and the Education Service Centers are critical to the success of technology integration in Texas and must be funded and staffed accordingly. Annual funding of $1 million for TEA and $450,000 average per ESC x 20 ESCs would provide the resources to leverage the technology leadership capacity of these organizations. Additional funding should also be provided for the implementation of any additional legislation that requires TEA and ESC leadership.

Accountability

Priority 4. Technology Applications Accountability

No Child Left Behind (NCLB) calls for all students to be technology literate by the end of the 8th grade. Texas defines "technology literate" as meeting the state's Technology Applications Texas Essential Knowledge and Skills for grades K-8. To further support this federal requirement, the

current Long-Range Plan makes the expectation that Texas students become proficient in the Technology Applications TEKS. These TEKS are to be taught integrated into core subjects. In addition, they can be taught in specialized classes. All students are expected to have mastered the 6th - 8th grade Technology Applications TEKS by the end of the 8th grade. There are other benchmarks at grades 2 and 5. States are required to ensure that students are meeting the state Technology Applications standards as a part of NCLB. However, since there is no statewide accountability measure required of school districts to report student mastery of the Technology Applications TEKS, there is no guarantee that all students will meet the NCLB technology literacy requirement for all 8th grade students.

Priority 5. Teacher Competencies and Certifications

Among the elements of effective technology integration and student learning, teacher competencies in Technology Applications are among the most significant. All of the investments in hardware, software, online resources, networks, Internet, planning, and others will not produce the desired results in learning if teachers do not possess the knowledge and skills necessary to integrate technology into their daily educational planning and classroom instruction.

NCLB requires that technology be fully integrated into curricula and instructional strategies. This requirement is supported in the current Long-Range Plan. Technology is included in all subject area TEKS. Its use is essential for today's 21st Century classrooms. Beginning teachers are taught the SBEC Technology Applications state standards in their teacher preparation courses and then tested on those standards as a part of their certification exams. The SBEC state standards are based on the Technology Applications competencies (TEKS) that all students are expected to master by the end of the 8th grade. Teachers are therefore expected to possess the same level of technology skills as all 8th-grade students, plus skills for teaching and using technology as a part of classroom instruction and administration.

The State Board of Education recently adopted a rule in response to SB 815 that requires that schools teach all the TEKS in both the foundation and enrichment curriculum areas. This requirement means that the Technology Applications TEKS that are provided for elementary grades (K-5) are no longer guidelines but are requirements. This means that in-service teachers at those grade levels must also have those Technology Applications skill levels in order to teach and reinforce the Technology Applications TEKS.

Even so, there is no official formalized statewide process that measures and reports the SBEC technology applications competencies of existing veteran teachers. Many, but not all districts are addressing this issue locally using resources produced either by the districts, by ESCs or other vendors. A consistent statewide process that will assure that all students have access to teachers who are proficient in the SBEC Technology Applications competencies is needed.

SBEC should establish criteria for a Technology Applications Supplemental Endorsement for all teachers and approve statewide and local assessment programs that meet that criteria. This supplemental endorsement should be voluntary unless required by the district.

The Texas Education Agency should accept the Technology Applications Supplemental Endorsement as one way for districts to document teacher competencies to meet NCLB requirements. Educators mastering the Technology Applications competencies as measured by the Technology Applications Supplemental Endorsement or other state approved local programs should be reported by school districts to TEA to be included in the state accountability system.

Economy and Efficiency

Priority 6. Texas Library Connection Resources

The Texas Library Connection provided school districts statewide with a wealth of online reference materials and databases, including electronic reference materials, encyclopedias, maps, newspapers, magazines, and a catalog of more than 5,000 school library holdings including more than 50 million items. These statewide resources were provided for students by the state at no cost to districts, which not only provided equity but also provided the resources to Texas students at the lowest possible costs. The resources were accessible from the classroom, the school library, and from the students' and educators' homes. The TLC budget was $4 million the last year it was implemented. This allowed for all the resources, training, and assistance to be provided at less than $1 per student per year.

The loss of the Texas Library Connection (TLC) has forced districts to do without these valuable online databases and resources or find ways to fund only a portion of those resources locally at much higher costs per student to the taxpayer. The TLC saved Texas taxpayers significant amounts of money because without it, each district now has to purchase these resources independently at a much higher per student cost and only if local funds are available. The Texas Library Connection should be restored to provide equitable access to resources for students and teachers that support the curriculum and promote student engagement and academic success.

Priority 7. Statewide Broadband Access and Support

With the creation and implementation of the LoneStar Education and Research Network (LEARN), school districts and regional networks will have the opportunity to utilize available bandwidth, gain access to Internet2, and expand collaborations with higher education institutions in their areas. There is a growing demand for dual-credit classes and applications that require secure and quality connections.   By school districts leveraging LEARN, opportunities will lead to a broadband education network in Texas that can support K-20 collaborations, future growth of Internet usage, online testing and online learning, and bandwidth demands for electronic instructional materials.

The regional networks supported by the Education Service Centers provide Internet access to more than 85% of the school districts and charter schools in Texas. By providing broadband connections between service centers utilizing the LEARN network, regional service centers can eliminate redundant connections and be able to plan collaborative projects that utilize the greater bandwidth and that will result in exponential growth of network usage in the schools. Funding is required for the initial connection with on-going costs paid under a cost-recovery method.

Priority 8. State Data Standards

Districts are losing valuable time and efficiency of funds due to a lack of standardization of educational and management software. Many times districts try to integrate data systems or online learning management systems across disparate applications and are either not able to make the integration work or have to invest significant human resources or funds into the project to achieve a solution. If data standards were required, then data from different systems could be shared among all the systems in use, saving significant time and money. Data-driven decision-making warrants the ability to have access to a vast amount of data from a host of various software programs and online resources. Data from online testing should easily integrate into curriculum management programs that allow educators to not only analyze data but also tie that data directly to curriculum planning, management, and individual student's needs and instructional plans.

Texas must adopt standards to help districts work more effectively and efficiently. The standards should also address compliance with the Section 508 accessibility standards to ensure access for people with disabilities. The new National Education Technology Plan recommends that states ensure interoperability as one of its seven major action steps.

Compliance with the standards and the accessibility standards outlined in Section 508 of the Rehabilitation Act, including backward compatibility, as a requirement for all software, assessments, or other programs that are required by the state or that are funded with state funds must be included.

Long Term Priorities 2010-2020

Dedicated Technology Funding for Target Tech:

The *Long-Range Plan for Technology, 1996-2010* established a goal of a ratio of 4:1 students to computer by 2004; and a goal of 1:1 students to computer by 2010. The Target Tech district-level STaR Chart established a 4:1 student-to-multimedia computer ratio with on-demand access for all students. The state and districts need to address the additional goal established in the Texas Long-Range Plan for 1:1 student-to-computer on-demand access to computers to "ensure that access is appropriate."

Error!

Dedicated Technology Funding to Allow All Districts to Gain and Maintain Target Tech

- Student-to-Computer Ratio (4:1) & (1:1) — 44%
- Technical Support (350:1) — 26%
- Instructional Support/Professional Development (30%) — 30%
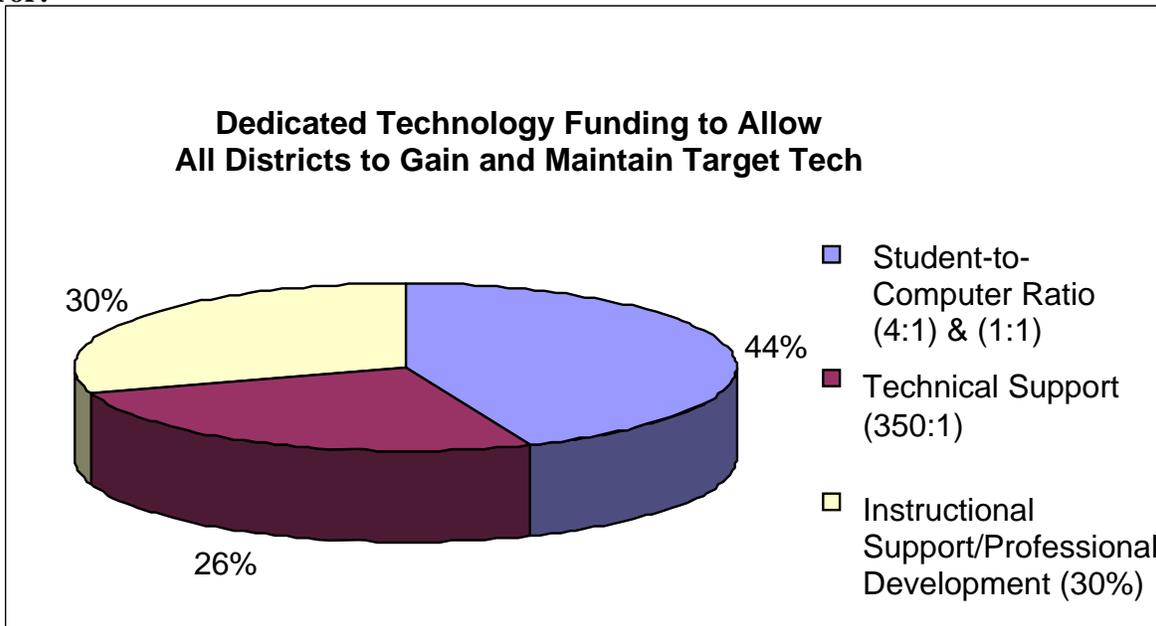
The Technology Allotment should be an amount that will give districts the opportunity to reach and maintain the Target Tech level on the Texas District STaR Chart in the three major cost areas. They are Student-to-Computer Ratio (4:1) for multimedia computers with a total of (1:1) for computers overall; Technical Support (350:1); and Professional Development (30%). Calculating multimedia computers at $1,200 per computer, non multimedia computers that are appropriate to the grade level at an average of $500 per computer, a replacement cycle of every four years, a 350:1 technical support ratio based on a $35,000 annual cost per technician, and professional development at 30% of the technology allotment, the dedicated technology funding needs to be approximately $384 per student per year. With the advancements in technology and increased competition, the cost per device should decrease over time. A comprehensive funding strategy is key to reaching Target Tech.

This dedicated technology funding may need to be shared between the state and districts based on a formula that will allow all districts to reach and maintain this level over the next few years. This allotment will only provide for these three major areas of technology immersion, but it is the foundation upon which technology can truly impact the instruction of all students (including elements that ensure equitable access to students with disabilities). Districts will still need to provide the additional components mentioned earlier that are outside this dedicated technology funding and that should be factored into the state versus the district share formula.

Combining the state and local district effort will allow all students to have access to the necessary technology that will enable them to learn and prepare for the jobs of the 21st Century. These amounts reflect the actual cost of providing these three educational technology services. The State and the local districts should make this commitment to providing these services for students. These funding amounts will also provide schools with the sustainability that they need in the areas of student-to-computer ratio, technical support, and well-trained teachers.

State Educational Technology Funding Chart Data

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Technology Allotment	$103,000,000	$105,600,000	$107,600,000	$109,400,000	$112,100,000	$113,100,000	$115,600,000	$118,800,000	$125,000,000	$115,000,000
Telecommunications Infrastructure Fund	$ 23,800,000	$ 28,500,000	$ 92,300,000	$ 58,800,000	$112,100,000	$ 91,700,000	$ 77,700,000	$0	$0	$0
Public Access Initiative			$1,850,000	$ 2,000,000	$ 5,067,500	$ 5,067,500	$ 3,500,000	$ 3,500,000	$0	$0
School Library Services					$ 923,444	$ 778,497	$ 811,952	$0	$0	$0
Technology Preview and Training Centers	$ 6,000,000	$ 8,000,000	$8,000,000	$8,000,000	$ 8,000,000	$ 8,000,000	$ 8,000,000	$ 4,000,000	$0	$0
Texas Library Connection	$1,080,000	$ 650,000	$1,800,000	$1,825,000	$ 2,500,000	$ 3,500,000	$ 3,750,000	$ 3,900,000	$0	$0
T-STAR	$ 2,250,000	$1,750,000	$1,750,000	$ 2,000,000	$ 3,000,000	$ 2,500,000	$ 2,250,000	$ 1,395,000	$0	$0
Ed Tech Pilots	$ 1,570,000	$ 500,000	$ 150,000	$175,000	$ 1,000,000	$ 1,307,200	$ 1,133,600	$ 883,600	$0	$0
TENET	$ 3,500,000	$ 3,650,000	$2,450,000							
TCET	$ 400,000	$ 400,000								
TETN	$ 200,000	$ 50,000	$ 950,000	$1,600,000	$1,100,000	$ 600,000	$ 150,000	$ 110,000	$0	$0
Totals	$141,800,000	$149,100,000	$216,850,000	$183,800,000	$245,790,944	$226,553,197	$212,895,552	$132,588,600	$125,000,000	$115,000,000

Ratio of Students Per Computer

	2000	2001	2002	2003	2004	2005
Ratio of Students to Computer	4.30	3.70	3.30	3.50	3.30	3.40
Ratio of Students to Computer Adjusted Based on 50% Obsolescence Factor	8.60	7.40	6.60	7.00	6.60	6.80

Internet Bandwidth (Sample)

Internet Bandwidth (mbps)	2001	2002	2003	2004	2005
Region 2	10	15	40	70	70
Region 11	27	35	65	95	154
Region 13	30	40	75	90	90
Region 14	10	10	14	45	45
Region 16	9	18	24	27	65
Region 17	9	15	18	18	18

Technology Allotment to Support and Sustain Advanced Tech

	Estimated Enrollment	Estimated Enrollment	Estimated Enrollment	Estimated Enrollment	Estimated Enrollment	Estimated Enrollment
Number of students	4,532,763	4,609,095	4,686,712	4,765,636	4,845,889	4,927,494
Advanced Tech	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Technology and Infrastructure(4:1)	$ 339,957,223	$ 345,682,103	$ 351,503,390	$ 357,422,707	$ 363,441,705	$ 369,562,063
Technical Support (500:1)	$ 79,323,352	$ 80,659,157	$ 82,017,458	$ 83,398,632	$ 84,803,065	$ 86,231,148
Instructional Support/Professional Development (25%)	$ 139,760,192	$ 142,113,753	$ 144,506,949	$ 146,940,446	$ 149,414,923	$ 151,931,070
Total	$ 559,040,767	$ 568,455,014	$ 578,027,796	$ 587,761,784	$ 597,659,693	$ 607,724,282
Technology Allotment	$123	$123	$123	$123	$123	$123

 * $300 per computer per year for four years
 ** $35,000 per technician per 500 computers

Infrastructure and Related Technical Support

	Estimated	Estimated	Estimated	Estimated	Estimated	Estimated
ADA	4,532,763	4,609,095	4,686,712	4,765,636	4,845,889	4,927,494
Infrastructure and Related Technical Support	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
$35 Per ADA	$158,646,704	$161,318,315	$164,034,915	$166,797,263	$169,606,129	$172,462,296

Technology Allotment to Support and Sustain Target Tech

	Estimated	Estimated	Estimated	Estimated	Estimated	Estimated
ADA	4,532,763	4,609,095	4,686,712	4,765,636	4,845,889	4,927,494
Target Tech - Multimedia	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Technology and Infrastructure (4:1) Multimedia	$ 339,957,223	$ 345,682,103	$ 351,503,390	$ 357,422,707	$ 363,441,705	$ 369,562,063
Technical Support (350:1)	$ 113,319,074	$ 115,227,368	$ 117,167,797	$ 119,140,902	$ 121,147,235	$ 123,187,354
Instructional Support/Professional Development (30%)	$ 194,261,270	$ 197,532,630	$ 200,859,080	$ 204,241,547	$ 207,680,974	$ 211,178,322
total	$ 647,537,568	$ 658,442,101	$ 669,530,266	$ 680,805,156	$ 692,269,914	$ 703,927,740
Technology Allotment	$143	$143	$143	$143	$143	$143
* $300 per computer per year for 4 years						
** $35,000 per technician per 350 computers						
	PLUS Allotment to reach 1:1					
	Estimated	Estimated	Estimated	Estimated	Estimated	Estimated
	4,532,763	4,609,095	4,686,712	4,765,636	4,845,889	4,927,494
Target Tech - Non Multimedia	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Technology and Infrastructure (1:1) Non Multimedia	$ 424,946,529	$ 432,102,629	$ 439,379,237	$ 446,778,383	$ 454,302,131	$ 461,952,579
Technical Support (350:1)	$ 339,957,223	$ 345,682,103	$ 351,503,390	$ 357,422,707	$ 363,441,705	$ 369,562,063
Instructional Support/Professional Development (30%)	$ 327,815,894	$ 333,336,314	$ 338,949,697	$ 344,657,610	$ 350,461,644	$ 356,363,418
total	$1,092,719,646	$1,111,121,045	1,129,832,324	$1,148,858,700	$1,168,205,481	$1,187,878,061
Technology Allotment	$241	$241	$241	$241	$241	$241
* $125 per computer per year for 4 years						
** $35,000 per technician per 350 computers						
	Total Target Tech (4:1 and 1:1)					
Total Target Tech	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Technology and Infrastructure (1:1) total	$ 764,903,753	$ 777,784,732	$ 790,882,627	$ 804,201,090	$ 817,743,836	$ 831,514,643
Technical Support (350:1)	$ 453,276,298	$ 460,909,471	$ 468,671,186	$ 476,563,609	$ 484,588,940	$ 492,749,418
Instructional Support/Professional Development (30%)	$ 522,077,164	$ 530,868,944	$ 539,808,777	$ 548,899,157	$ 558,142,618	$ 567,541,740
total	$1,740,257,215	$1,769,563,146	$1,799,362,590	$1,829,663,856	$1,860,475,395	$1,891,805,801
Technology Allotment	$384	$384	$384	$384	$384	$384

No Child Left Behind Act – Title II Part D

ELEMENTARY & SECONDARY EDUCATION
Part D — Enhancing Education Through Technology

SEC. 2401. SHORT TITLE. This part may be cited as the 'Enhancing Education Through Technology Act of 2001'.

SEC. 2402. PURPOSES AND GOALS.

(a) PURPOSES- The purposes of this part are the following:

(1) To provide assistance to States and localities for the implementation and support of a comprehensive system that effectively uses technology in elementary schools and secondary schools to improve student academic achievement.

(2) To encourage the establishment or expansion of initiatives, including initiatives involving public-private partnerships, designed to increase access to technology, particularly in schools served by high-need local educational agencies.

(3) To assist States and localities in the acquisition, development, interconnection, implementation, improvement, and maintenance of an effective educational technology infrastructure in a manner that expands access to technology for students (particularly for disadvantaged students) and teachers.

(4) To promote initiatives that provide school teachers, principals, and administrators with the capacity to integrate technology effectively into curricula and instruction that are aligned with challenging State academic content and student academic achievement standards, through such means as high-quality professional development programs.

(5) To enhance the ongoing professional development of teachers, principals, and administrators by providing constant access to training and updated research in teaching and learning through electronic means.

(6) To support the development and utilization of electronic networks and other innovative methods, such as distance learning, of delivering specialized or rigorous academic courses and curricula for students in areas that would not otherwise have access to such courses and curricula, particularly in geographically isolated regions.

(7) To support the rigorous evaluation of programs funded under this part, particularly regarding the impact of such programs on student academic achievement, and ensure that timely information on the results of such evaluations is widely accessible through electronic means.

(8) To support local efforts using technology to promote parent and family involvement in education and communication among students, parents, teachers, principals, and administrators.

(b) GOALS-

(1) PRIMARY GOAL- The primary goal of this part is to improve student academic achievement through the use of technology in elementary schools and secondary schools.

(2) ADDITIONAL GOALS- The additional goals of this part are the following:

(A) To assist every student in crossing the digital divide by ensuring that every student is technologically literate by the time the student finishes the eighth grade, regardless of the student's race, ethnicity, gender, family income, geographic location, or disability.

(B) To encourage the effective integration of technology resources and systems with teacher training and curriculum development to establish research-based instructional methods that can be widely implemented as best practices by State educational agencies and local educational agencies.

National Educational Technology Plan

Seven Major Action Steps and Recommendations

1. Strengthen Leadership

For public education to benefit from the rapidly evolving development of information and communication technology, leaders at every level – school, district and state – must not only supervise, but also provide informed, creative and ultimately transformative leadership for systemic change.

Recommendations for states, districts and individual schools include:
- Invest in leadership development programs to develop a new generation of tech-savvy leaders at every level.
- Retool administrator education programs to provide training in technology decision-making and organizational change.
- Develop partnerships between schools, higher education and the community.
- Encourage creative technology partnerships with the business community.
- Empower students' participation in the planning process.

2. Consider Innovative Budgeting

Needed technology often can be funded successfully through innovative restructuring and reallocation of existing budgets to realize efficiencies and cost savings. The new focus begins with the educational objective and evaluates funding requests – for technology or other programs – in terms of how they support student learning. Today, every program in *No Child Left Behind* is an opportunity for technology funding – but the focus is on how the funding will help attain specific educational goals.

Funding and budgetary recommendations for states, schools and districts include:
- Determine the total costs for technology as a percentage of total spending.
- Consider a systemic restructuring of budgets to realize efficiencies, cost savings and reallocation. This can include reallocations in expenditures on textbooks, instructional supplies, space and computer labs.
- Consider leasing with 3-5 year refresh cycles.
- Create a technology innovation fund to carry funds over yearly budget cycles.

3. Improve Teacher Training

Teachers have more resources available through technology than ever before, but some have not received sufficient training in the effective use of technology to enhance learning. Teachers need access to research, examples and innovations as well as staff development to learn best practices. The U.S. Department of Education is currently funding research studies to evaluate the effective use of technology for teaching and learning. The National Science Foundation also provides major support for educational research.

Recommendations for states, districts and individual schools include:
- Improve the preparation of new teachers in the use of technology.
- Ensure that every teacher has the opportunity to take online learning courses.
- Improve the quality and consistency of teacher education through measurement, accountability and increased technology resources.
- Ensure that every teacher knows how to use data to personalize instruction. This is marked by the ability to interpret data to understand student progress and challenges
- drive daily decisions and design instructional interventions to customize instruction for every student's unique needs.

4. Support e-Learning and Virtual Schools

In the past five years there has been significant growth in organized online instruction (e-learning) and "virtual" schools, making it possible for students at all levels to receive high quality supplemental or full courses of instruction personalized to their needs. Traditional schools are turning to these services to expand opportunities and choices for students and professional development for teachers.

Recommendations for states, districts and schools include:
- Provide every student access to e-learning.
- Enable every teacher to participate in e-learning training.
- Encourage the use of e-learning options to meet *No Child Left Behind* requirements for highly qualified teachers, *No Child Left Behind* supplemental services and parental choice.
- Explore creative ways to fund e-learning opportunities.
- Develop quality measures and accreditation standards for e- learning that mirror those required for course credit.

5. Encourage Broadband Access

Most public schools, colleges and universities now have access to high-speed, high-capacity broadband communications. However, broadband access 24 hours a day, seven days a week, 365 days a year could help teachers and students to realize the full potential of this technology and broadband technology needs to be properly maintained.

Recommendations to states, districts and schools include:
- Thoroughly evaluate existing technology infrastructure and access to broadband to determine current capacities and explore ways to ensure its reliability.
- Encourage that broadband is available all the way to the end-user for data management, online and technology-based assessments, e-learning, and accessing high-quality digital content.
- Encourage the availability of adequate technical support to manage and maintain computer networks, maximize educational uptime and plan for future needs.

6. Move Toward Digital Content

A perennial problem for schools, teachers and students is that textbooks are increasingly expensive, quickly outdated and physically cumbersome. A move away from reliance on textbooks to the use of multimedia or online information (digital content) offers many advantages, including cost savings, increased efficiency, improved accessibility, and enhancing learning opportunities in a format that engages today's web-savvy students.

Recommendations to states and districts include:
- Ensure that teachers and students are adequately trained in the use of online content.
- Encourage ubiquitous access to computers and connectivity for each student.
- Consider the costs and benefits of online content, aligned with rigorous state academic standards, as part of a systemic approach to creating resources for students to customize learning to their individual needs.

7. Integrate Data Systems

Integrated, interoperable data systems are the key to better allocation of resources, greater management efficiency, and online and technology-based assessments of student performance that empower educators to transform teaching and personalize instruction.

Recommendations to states, districts and schools include:
- Establish a plan to integrate data systems so that administrators and educators have the information they need to increase efficiency and improve student learning.
- Use data from both administrative and instructional systems to understand relationships between decisions, allocation of resources and student achievement.
- Ensure interoperability. For example, consider School Interoperability Framework (SIF) Compliance Certification as a requirement in all RFPs and purchasing decisions.
- Use assessment results to inform and differentiate instruction for every child.

Glossary

ADA
Average Daily Attendance. School districts in Texas receive funding based on Average Daily Attendance.

AEIS
Academic Excellence Indicator System; this state data collection system pulls together a wide range of information on the performance of students at each Texas school and district.

Assistive Technology Device
Any item, piece of equipment or product system, whether acquired commercially off the shelf, modified or customized, that is used to increase, maintain or improve the functional capabilities of children with disabilities.

Bandwidth
The capacity of a network or data connection to transmit data.

Broadband
A class of technologies that offer high-speed Internet access to homes and businesses. DSL and Cable Modems are typical broadband technologies.

Broadcasting
Historically, "broadcasting" referred to the activity of radio and television stations. As cable, satellite, and the Internet have developed, it is often used to describe the simultaneous real-time distribution of any media from one source to many recipients, using any transport method.

Collaboratively Developed Technology Plan
Plan for the use of technology in a campus or district developed with active involvement of teachers, school staff, administrators, students, industry and other community representatives.

Collaborative Learning
Instructional strategy in which several students and/or teachers work together on an assignment with individuals sharing responsibility for various tasks in an interactive process of ongoing dialogue.

Community of Inquiry
All terms are used interchangeably to identify a group of persons engaged in ongoing dialogue about questions of shared interest or mutual concern for the purpose of generating workable, productive solutions to meaningful problems or adding enhancement to an existing knowledge base related to common interest.

Complex Thinking Strategies
Includes problem solving, decision-making, investigation and reflective thinking.

Computer
A device that runs programs to display and manipulate text, graphics, symbols, audio, video and numbers.

Computer Software
Software is a generic term for organized collections of computer data and instructions, often broken into two major categories: system software that provides the basic non-task-specific functions of the computer, and application software which is used by users to accomplish specific tasks.

Data Accessibility Standards
See Section 508

Datacast
Delivery of program-related or non-program-related data files over a one-way broadcasting medium (like digital television). If communication is required from the viewer back to the broadcaster, an additional back channel is required.

Dial-up Connectivity
Computers cabled to a telephone port for Internet connectivity; somewhat slower than a direct connection to the Internet.

Digital Content
Digitized multimedia materials requiring students to manipulate information creatively; may include video, software, websites, simulations, streamed discussion, databases and audio files.

Direct Connection to the Internet
Computers are connected to the Internet via a telephone line usually leased from the telephone company. At many Texas schools, the connection goes to the Education Service Center and then out to the Internet. This service is much faster than a dial-up line in a school. Many people have DSL or Cable connections to the Internet at home.

Distance Learning
An educational process delivered and supported by technology (Internet, satellite, videoconferencing, emerging technologies, etc.) in which the teacher and student are separated by time and/or space.

District Information System
A database of district-wide information which may include student, financial, or other administrative information necessary for local, state and federal reporting requirements.

DTV
The general term for digital television. Although first used to identify digital terrestrial broadcasting, it is sometimes used to describe any form of digital television including digital cable and DVD players. The Consumer Electronics Association even uses it to describe analog displays with component inputs.

Easy Internet Access
Ready access to a computer connected to the Internet with a priority of student use, located in reasonable proximity.

Educator
Professional employee who holds a valid certificate or permit in order to deliver instruction to students; these employees may include classroom teachers, librarians, principals, counselors, or paraprofessionals delivering instruction under the direction of a certified teacher.

eLearning
An umbrella term that refers to online or virtual courses, distance learning by other electronic methods and the use of technology to support teaching, learning, and professional development.

Electronic Textbook (e-book)
Includes computer software, interactive videodisc, magnetic media, CD-ROM, computer courseware, on-line services, an electronic medium, or other means of conveying information to the student or otherwise contributing to the learning process through electronic means.

E-Rate
Federal discounts to assist schools and libraries to obtain affordable telecommunications and Internet access. Funded out of the Federal Universal Service Fund.

ETAC
Educational Technology Advisory Committee appointed by the Commissioner of Education to advise the TEA concerning technology issues in Texas.

Emerging Technologies

Newer, developing technologies; ever changing digital equipment; convergence of technologies.

Flexible Scheduling

A strategy for providing access to educational resources that permits use as needed rather than on a predetermined schedule.

Higher Level Thinking

Thinking that takes place in the higher levels of the hierarchy of cognitive processing on a continuum from knowledge level to evaluation level (e.g., Bloom's Taxonomy); may include problem solving, decision making, investigation and reflective thinking.

HTML

HyperText Markup Language, the coding language used to create hypertext documents for the World Wide Web. In HTML, a block of text can be surrounded with tags that indicate how it should appear (for example, in bold face or italics). Also, in HTML a word, a block of text, or an image can be linked to another file on the Web. HTML files are viewed with a World Wide Web browser.

ICT

Information and Communication Technology Terminology used globally to define technology proficiencies.

Inquiry-based Learning

Children learn by generating new hypotheses, by taking risks and by reflecting on their accomplishments and miscues. Children engage in inquiry when they investigate questions or issues they find compelling. These questions or issues may be related to a class theme or concept.

Instructional Materials

Instructional materials means all materials that are designed for use by pupils and their teachers as a learning resource and help pupils acquire facts, skills, or opinions or develop cognitive processes. Instructional materials may be printed or non-printed, and may include textbooks, technology-based materials, other educational materials, and tests.

Instructional Setting

Location where teaching and learning takes place.

Integrated/Integration

Use of technology by students and teachers to enhance teaching and learning and to support curricular objectives.

Internet

Global network of networks that connects worldwide computers through digital systems.

Internet2

A consortium led by 207 universities working in partnership with industry and government to develop and deploy advanced network and applications technologies.

Internet-connected, Multimedia Computer

A computer capable of presenting combinations of text, graphics, animation and streaming audio or video; the computer also should be connected to the Internet.

Interoperability

The ability of products, systems, or business processes to work together to accomplish a common task. The term can be defined in a technical way or in a broad way, taking into account social, political and organizational factors.

LAN (Local Area Network)

A network that connects computers in the same building.

LEARN

The LoneStar Education And Research Network (LEARN) is a cooperative effort of 33 institutions of higher education in Texas to provide high-speed connectivity between their institutions as well as to research networks across the country in support of higher education's research, teaching, health care, and public service missions.

Librarians

Campus librarians are included in the term "teacher" used throughout the Texas Teacher STaR Chart.

LEA

Local Education Agency. In Texas, public school districts, open-enrollment charter schools and regional education service centers are defined as local education agencies.

Local Funding

Funds derived from local budgets, district fees, bond issues, and other local initiatives.

LRPT (Long-Range Plan for Technology)

Texas plan for integrating technology into the school system. Four key areas are: Teaching and Learning, Educator Preparation and Development, Leadership, Administration and Support Services and Infrastructure for Technology.

Minimal Release Time

Less than six hours per school year.

Mobile Technology

Easily transported equipment such as cell phones, handheld devices, laptop computers and projectors that are wireless and battery operated.

MTT

Master Technology Teacher (MTT) All Level Certificate. The MTT Certificate is designed to prepare teachers to mentor other teachers and work with students in order to increase the use of technology in each classroom.

Multimedia

Combining text, graphics, full-motion video, sound and/or combining movies, music, lighting, CD-ROMs, DVDs and the Internet and/or combining television, radio, print and the Internet.

NETP

National Educational Technology Plan released by the U. S. Department of Education in January 2005.

Networked Connectivity

Computers are cabled to a data port for sharing files, storing files, printing and Internet connectivity.

NCLB

No Child Left Behind Act of 2001 is the reauthorization of the Elementary and Secondary Education Act.

On-Demand Access

Immediate access to technology tools as needed in all campus instructional settings.

Online Databases

Internet accessible databases providing resources such as encyclopedias, periodicals, biographies, historical timelines, maps and atlases, almanacs, audio clips, video clips and student and teacher resources.

Online Learning

Sometimes referred to as web-based learning, virtual learning, or e-learning, online learning is a highly interactive form of distance learning, which is primarily delivered via the Internet. Content and resources are accessed via the web, and communication, learning activities, and instructions from a teacher take place in a virtual (web-based) environment.

Open-Source Software
Computer software available with its source code and under an open source license to study, change, and improve its design.

PDF
PDF (Portable Document Format) is a file format that has captured all the elements of a printed document as an electronic image that you can view, navigate, print, or forward to someone else. PDF files are created using Adobe Acrobat, Acrobat Capture, or similar products. To view and use the files, you need the free Acrobat Reader, which you can easily download. Once you've downloaded the Reader, it will start automatically whenever you want to look at a PDF file.

Portable Technologies
Technologies that are lightweight and small enough to carry such as laptop computers, hand-held devices, PDAs (Personal Digital Assistant).

Print/File Sharing Access
Both files and printers are available from the school or district network.

Problem-Solving Strategies
Process by which learners identify goals and obstacles, identify/research alternative ways to solve the problem, select an alternative based on evaluation criteria, test the alternative and finally evaluate results.

Professional Development
Also referred to as staff development or in-service training. Includes the National Staff Development Council's major models of professional development: training, observation/assessment, involvement in a development/improvement process, study groups, inquiry/action research, individually guided activities and mentoring.

Professional Development Follow-up
Teacher learns about and/or creates work which is implemented, shared and discussed at a later date; teacher may work with other teachers, technology specialists, or administrators to reflect upon their instructional practice for the purpose of improving student instruction.

Regional ESC
Regional Education Service Center School districts across the state can turn to the ESC in their area for services that enhance efficiency, effectiveness and the performance of students, teachers and administrators. There are 20 ESCs in the state.

Replacement Cycle
School policy for purchase, replacement and upgrade cycle of technology equipment and software.

SBEC
State Board for Educator Certification.

Seamless Integration
Using technology as a natural tool; used routinely; becomes the way work is done.

Section 508 of the U.S. Rehabilitation Act
Requires that electronic and information technology developed, procured, used, or maintained by all agencies and departments of the Federal Government be accessible both to Federal employees with disabilities and to members of the public with disabilities, and that these two groups have equal use of such technologies as federal employees and members of the public that do not have disabilities.

State and Federal Funds
State funds such as, but not limited to, the Technology Allotment; federal funds such as, but not limited to, No Child Left Behind (NCLB) and E-Rate.

Supplement not Supplant
Additional funds used to provide activities, but not used to replace local, state or federal funds already in place.

TA
Technology Applications is the curriculum area that defines what all students should know and be able to do with technology K-12.

TA TEKS
Technology Applications Texas Essential Knowledge and Skills.

Technology
Examples: computer workstations, laptop computers, wireless computers, handheld computers, digital cameras, probes, scanners, digital video cameras, analog video cameras, televisions, telephones, VCRs, digital projectors, programmable calculators, interactive white boards.

Technology Accommodation
Ergonomic, accessible office furniture and computer workstation accessories such as keyboards, Braille readers, pointing devices, screen readers and speech recognition for all learners.

Technology Allotment
State funds provided to Texas school districts to support the goals of the Long Range Plan for Technology. The current level of funding is $30 per student per year.

Technology Applications
A required enrichment curriculum specified in TEC §28.002 with curriculum requirements in 19 TAC Chapter 74 and student standards in Chapter 126. This curriculum focuses on the teaching, learning, and integration of digital technology skills across the curriculum at Grades Pre-kindergarten through Eight.

Technology Literacy
Responsible use of appropriate technology to communicate, problem-solve as well as to access, manage, integrate, evaluate and create information to improve learning in all subject areas in order to acquire 21st century knowledge and skills.

TETN
Texas Education Telecommunications Network – connects all 20 Education Service Centers and the Texas Education Agency with a comprehensive, integrated state technology system for voice, video and data.

Texas Teacher Technology Competencies Certification (TexasTTCC)
An on-line portfolio assessment and Technology Applications certification offered by the Education Service Centers of Texas.

THECB
Texas Higher Education Coordinating Board, created by the Texas Legislature in 1965 to "provide leadership and coordination for the Texas higher education system to achieve excellence for the college education of Texas students."

Texas STaR Chart
Online School Technology and Readiness (STaR) tool allowing campuses and teachers to assess technology development and use. Developed by the Educational Technology Advisory Committee.

Two-Way Interactive Video Distance Learning
Real time (synchronous) instruction via telecommunication lines, interaction with video and audio between two or more sites delivered to a videoconference room or portable videoconference unit.

Ubiquitous

Being or seeming to be everywhere at the same time.

Video Streaming

Video delivered to the computer desktop; video that can be viewed from the Web in real time as well as saved for later viewing.

WAN (Wide Area Network)

A network in which two or more buildings are connected, such as campuses in a district or districts in a region.

Web-Enabled

Web-enabled applications involve adding a Web interface to traditional applications that may have been created even before there was a Web.

Wireless Connectivity

Computers with wireless capabilities to connect to the Internet when located near access points/boxes which are connected to the data ports. The computers are not cabled to the data port.

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