TECHNOLOGY IN P-12 EDUCATION

A RENEWED COMMITMENT

STATE OF ILLINOIS
FIVE-YEAR PLAN
2002-2007
EXECUTIVE SUMMARY

The 1995 State Plan for Information Technology in K-12 Education provided an exceptional platform for systematically introducing technology into Illinois schools and using it to improve the education of Illinois students. Thanks to the hard work of thousands of educators and citizens throughout the State, Illinois has made remarkable progress in a very short period.

As a result of the 1995 State Plan, the State has created a policy and planning infrastructure that includes technology standards for students and educators, systematic planning at the local level, two state funding streams and a statewide backbone for connectivity. Regional technology centers provide leadership and support for local school districts, and the State Board provides a wide variety of resources for educators, parents and citizens.

The impact on Illinois schools has been significant. Almost all local districts and a majority of school buildings are now connected to the Internet, and the State’s ratio of students to computers is better than the national average. Most teachers have received some technology training, and the use of technology to support engaged learning in the classroom is increasing throughout the State. It is now possible for many Illinois students to access almost any library in the world, to take virtual field trips to museums and cultural institutions, to “work” with adults on real-world problems such as stream monitoring, and to take coursework that expands their learning options well beyond the traditional curriculum in their local school districts.

These accomplishments set the stage for the next phase of technology growth and development in Illinois P-12 education.

David Thornburg writes that, “Unless our thinking about education is transformed along with our continuing expansion of telematic technology into the classroom, our technology investment will fail to live up to its potential.” Don Tapscott, author of Growing Up Digital, concludes that unless the educational system fully embraces technology and its potential, schools will become largely irrelevant.

These comments reinforce the obligation of planners and policymakers to provide strong and strategic leadership for using technology to change the educational system, as well as the classroom. More critically, they illustrate the need to align the use of technology with the vision for education in the 21st century.
In Illinois, that vision calls for all of our students to be prepared to succeed in an increasingly complex, information-rich society. It calls for all students to have the higher-order knowledge and skills that will allow them to function effectively in an ever-changing environment and in a variety of roles. It calls for schools in which there is no achievement gap between groups of students, and for schools in which there are equal opportunities to meet the learning goals.

Current and emerging technologies provide unique opportunities to help achieve this vision. These technologies make it possible for Illinois students to have equal, high-quality learning opportunities regardless of where they live. Technologies make learning possible at any time and any place; support the development of advanced knowledge and skills and the ability to apply them to complex circumstances; and allow personalization of learning that can assist each student meet his or her individual goals and potential.

The new State Plan for Technology in P-12 Education will capitalize on these unique characteristics through a pyramid of goals.

**Overarching Goal**

Current and emerging technologies will help ensure that the Illinois educational system prepares all students to be successful in the 21st century.

**Key Technology Goals**

- Technology will support all Illinois students’ attainment of the higher-order knowledge and skills essential for success in the 21st century, including specific knowledge and skills related to technology use.
- Technology will provide all Illinois students with unprecedented and equitable access to rich, diverse and high-quality learning opportunities.

**Enabling or Supporting Technology Goals**

1. Knowledgeable and technologically-proficient educators
2. Technology fully integrated in instruction
3. Elimination of the digital divide through equitable access to technology resources
4. Sufficient funding
5. High-quality e-learning opportunities
6. Accountability
7. Efficiency and effectiveness

The strategies that will move Illinois toward these goals build on our accomplishments and reflect a renewed commitment to the effective use of technology for all students.
INTRODUCTION

“Vision is not seeing what is before our very eyes. Vision is imagining what our children’s eyes will later see and having the courage to boldly make it happen.”
(unknown author)

In the early 1990s, technology was a peripheral factor in the education of most students in Illinois schools. A 1992 report to the State Board of Education indicated that computers were not available in many districts, that when and where computers were purchased, they were typically placed in computer labs rather than classrooms; and that only a few school districts were beginning to consider the use of technology as an integral part of instruction. The report also noted that state leadership and support for linking technology and education had been extremely limited.

Responding to these conclusions and to the pressures of an increasingly technology-based environment, the State Board established a division responsible for technology leadership and support; hired Cheryl Lemke, a nationally-known advocate for technology in education, as its Associate Superintendent; and initiated development of the first statewide K-12 Information Technology Plan.

The Plan adopted in 1995 was considered remarkable for such a first effort. In fact, the State Plan enabled Illinois to be one of the first states in the nation to receive federal technology dollars under the Technology Literacy Challenge Fund (TLCF) program. That five-year program has provided Illinois with more than $79.6 million for local schools through a competitive grant process.

Development of the 1995 Plan engaged a wide variety of stakeholders and built a broad base of investment in its success. The vision behind that Plan was not technology per se, but rather the potential of technology for empowering Illinois students to be “creative, independent thinkers, equipped with the skills and understandings that will enable them to become lifelong learners, productive workers and contributing citizens.” Finally, the Plan was comprehensive and strategic, including initiatives focused on teacher professional development and technology-enriched designs for teaching and learning in addition to basic elements such as infrastructure and funding.
At least in part because of these characteristics, the 1995 State Plan provided the springboard for a quantum leap in the availability and use of technology in K-12 education. **Within just five years, Illinois moved from 49th to 4th place in the nation in the use of digital technology, with progress at the K-12 level ranked 2nd in the nation. This month Illinois received notice that we are now tied for first in the nation in the use of digital technology in education.**

Although these accomplishments are to be celebrated, the State Board recognized in 1995 that technology goals and initiatives must be revisited on a regular basis. It therefore created the trigger for such a periodic review process by giving the first statewide technology plan a five-year timeline and expecting that a new plan would be developed at the end of that period.

This second State Technology Plan is the result of that far-sighted Board decision.

Like its predecessor, this Plan is the culmination of a lengthy statewide planning process – similar in many respects to the community-based planning required of local districts – which involved discussions with hundreds of individuals from all walks of life and from all parts of the state. The findings and recommendations resulting from that process, which were presented in a report to the State Board of Education in March 2001, have been used as the primary resources for development of this Plan.

In addition, this Plan integrates information from the October 2001 report of the National Association of State Boards of Education study group on “e-Learning” and a preliminary report by the Metropolitan Planning Council and Network 21 on their work to develop an education technology agenda for Illinois. Both of these documents synthesized the many complex issues associated with technology in education, and each provided valuable guidance for making strategic choices among various options.

Other key sources of information and insight included an independent evaluation of technology in Illinois schools by Westat and the *Technology Counts 2001* report published by *Education Week*.

The State Board of Education is deeply grateful to all of the individuals who participated in the statewide planning process and extends particular appreciation to the coordinating committee members and the authors of the final report. Their understanding of issues and their passion for meaningful use of technology were invaluable in shaping the direction of this Plan. The Board is also grateful to Kristin Ciesemier, director of the North Central Regional Technology in Education Consortium, for continuing support and advice throughout this process.
The product of these collaborative efforts is a State Plan designed to provide a framework for action by state policymakers and local communities. The Plan establishes a direction and goals for the next five years* and identifies key strategies designed to move Illinois toward those goals.

The Plan is organized in five sections:

- **1995 Revisited**: excerpts from the 1995 *K-12 Information Technology Plan*;
- **Quantum Leap**: a discussion of accomplishments and key strategic actions in relation to the goals of the 1995 plan;
- **Miles to Go**: a discussion of the 1995 goals that will require further attention if they are to be fully realized;
- **Keeping up with the Future**: a discussion of new and emerging issues that are important to the character of the next Plan; and
- **Moving Forward**: a framework for the future, including a new vision statement, goals for the five-year period, key strategies and associated actions, and proposed measures for evaluating progress.

An Appendix shows the alignment between the Technology Goals in this State Plan and the State Board of Education Goals adopted in October 2001.

* Although Illinois’ State Technology Plans are established for five-year periods, this is intended to be a continuous improvement process. As a result, the activities associated with the plans don’t necessarily fit into discrete timeframes. For example, some of the activities incorporated into the first State Plan had begun before that Plan was completed and some of the recommendations that emerged from the 2000-2001 planning process have already been implemented.
1995 REVISITED

This Section provides selected highlights of the 1995 State Plan as a point of reference for reviewing progress. This includes the Vision for Learning Technologies in Illinois and a list of the knowledge and skills that students must develop to be successful in a world where technology has become ubiquitous. The latter list is known as the “Six Essential Learnings in a Technological Society.” This Section also includes the goals of the 1995 State Plan, which were essentially the recommended strategic actions, and the technology policies adopted by the State Board of Education.

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ILLINOIS STATE VISION FOR LEARNING TECHNOLOGIES
(1995)

All students in Illinois should be empowered to be creative, independent thinkers equipped with the skills and understandings that will enable them to become lifelong learners and productive citizens.

To be successful in a world characterized by change, global communication, and boundless information, they will need to have access to the most current and powerful information and communication technologies and will need to be given the opportunity to use them in ways that best develop skills in the Information Age. In this endeavor, they will become part of Illinois’ broader community of learners, sharing in discovery and learning with parents, teachers and their communities in educational endeavors that transcend restrictive boundaries of time and place.
1. **The student as information seeker, navigator and evaluator.** The student recognizes and values the breadth of information sources, browses those sources, differentiates and selectively chooses sources based on soundness and relevancy, and retrieves appropriate information/data using all forms of electronic/optical media, technology and telecommunications.

2. **The student as critical thinker, analyzer and selector of information and technologies appropriate to the task.** The student uses problem-solving techniques and technology tools to review information and data from a variety of sources; analyzes, synthesizes and evaluates it; and then transforms the myriad of ideas, data and information into useful information and knowledge. During this process the student discriminates among a variety of technologies and electronic/optical media to extend and expand his/her capabilities.

3. **The student as creator of knowledge using information resources and technology.** The student, both individually and as a successful member of a team, constructs new meaning and knowledge in all content areas, combining and synthesizing different types of information through technology, telecommunications and computer modeling/simulations.

4. **The student as effective communicator using a variety of appropriate technologies/media.** The student creates, produces and presents ideas, stories and unique representations of thoughts through a variety of electronic/optical media by analyzing the task before him/her and the technology tools available, appropriately selecting and using the most effective tool(s)/media for the purpose and audience.

5. **The student as a technical user.** The student develops the confidence, competence, information management strategies and sufficient technical skills to successfully install, setup and use the technology and telecommunications tools in his/her daily life, work situations and learning environments.

6. **The student as a responsible citizen in a technological age.** The student understands the ethical, cultural, environmental and societal implications of technology and telecommunications and develops a sense of stewardship and individual responsibility regarding his/her use of technology, media and telecommunications networks.
State Goals for Illinois Learning Technology
(1995)

Leadership, Partnership and Capacity-Building
Recommendation #1: Create Partnerships
Align public and private support to promote economic viability and educational opportunities in Illinois through collaborative, community-based approaches to technology investments.

Recommendation #2: Provide Leadership
Provide a thoughtful, systemic and collaborative approach to learning technologies through state leadership, advocacy and integration of technology into all facets of the public education system in Illinois.

Recommendation #3: Build Capacity
Build the capacity of local school districts to design, implement, update and assess community-based information technology plans which focus on improving student learning, ensuring equity, increasing economic viability and improving efficiency in the education system in Illinois.

Equity and Change: Support New Teaching and Learning Designs for All
Recommendation #4: Support Teaching and Learning Designs for All
Support technology-enriched designs for teaching and learning which meet educational challenges in new and different ways; enable learners, teachers, schools and communities to experience those new prototypes; and incorporate the best of those innovations into the state education system.

Recommendation #5: Ensure Equitable Access to Electronic Resources
Ensure students and educators in Illinois public schools of universal, equitable access to networked (on-line) information and resources and the knowledge, skills and context necessary to effectively use such learning tools.

Professional Development: Competence and Confidence
Recommendation #6: Develop Knowledgeable Educators
Build the capacity of Illinois educators to establish a student-centered, technology-enriched learning environment which results in increased student performance and economic viability.

Recommendation #7: Require Technology-enriched Teacher Preparation
Ensure that new teachers are prepared to take full advantage of the learning potential of technology and telecommunications.

Infrastructure: Affordable, Universal, Equitable Access
Recommendation #8: Assure Access and Infrastructure
Assure K-12 students and educators in Illinois public schools of affordable, universal access to high-speed, robust telecommunications avenues in school buildings which are modernized for technology.

Funding and Accountability
Recommendation #9: Guarantee Funding and Accountability
Consider funding for learning technologies as the joint responsibility of the state, school districts, business and local communities. Such funding/support should be aligned toward a common vision and contingent upon meeting established benchmarks, standards and protocols (1995)
Technology and telecommunications are keys to improving student learning in this and the next century. It is critical that equitable and universal access to technology and telecommunications be available to all students in the Illinois K-12 school system. The State Board of Education should be providing vision, leadership, advocacy and support for the technical and human resources necessary if K-12 schools are to improve student learning through technology and telecommunications.

1. State regulations should enable and encourage school districts to develop, implement and operate the technology/information plans to improve student learning and increase the efficiency of education systems.

2. To effectively serve K-12 students, Illinois schools must be part of an electronic network that is developed, deployed, operated and maintained through a collaborative and sustainable approach by state agencies, local school districts, higher education, communication groups, business and industry.

3. In order to provide equitable, ubiquitous access to electronic resources for K-12 students, K-12 interests must be represented in the telecommunications regulatory arena through leadership and advocacy.

4. Those entering the professions of teaching and educational administration and those earning degrees/certificates in education should understand and be able to use technology and telecommunications as instructional, administrative and learning tools.

5. Relevant, student-centered, ongoing professional development is essential to successful integration of technology and telecommunications in K-12 schools.

6. Students and their communities should have electronic access to public information and services.

7. The rethinking and redesign of teaching and learning is necessary if schools are to take full advantage of the learning potential inherent in technology and telecommunications.
QUANTUM LEAP

Development of this new state technology plan has included two essential steps: 1) evaluation of State’s progress since the first plan was adopted and 2) identification of the actions that had strategic impact on movement toward the goals. This Section describes key accomplishments during the past five years and the factors that contributed to them. This Section also illustrates current uses of technology in Illinois education.

In the spring of 2001, the Progress and Freedom Foundation and the Center for Digital Government released the results of a year-long study of the use of digital technology in states throughout America. The data showed that, within just five years, Illinois had moved from 49th to 4th place in the nation in the use of digital technology, with progress at the K-12 level ranked 2nd in the nation. This month we have received notice that Illinois is now tied for first in the nation in the use of digital technology in education. By any measure, that is a quantum leap.

In addition, the Center for Digital Government cited the Learning Technologies program at the Illinois State Board of Education as a “best practice” for the nation and named Illinois as the state having made the most overall progress in the use of digital technology. In these instances, Illinois truly has become Second to None.

The accomplishments that contributed to these rankings included the following.

- As of January 2001, 97.2% of Illinois school districts have a community-based technology plan that has been approved by peer review panels.

- Almost all Illinois school districts (98.9%) and a majority of school buildings (84%) are now connected to the Internet. Both of these ratios are above the national average.

- The ratio of students to instructional computer (4.9) is now equal or better than the national average. The ratio of students to multimedia computers is 8.0 vs. the national average of 7.9.

- Illinois students and teachers have access to a broad array of learning resources through state-funded projects like Marco Polo, Sue the Dinosaur, Museums in the Classroom, commercial online educational resources, and the new Schools Without Walls (http://www.isbe.net/learn-technology).

- Illinois students have access to expanded curricular opportunities through the new Illinois Virtual High School (IVHS) (http://www.ivhs.k12.us). More than 300 students in 57 public school districts are participating in 46 full-semester courses through IVHS this fall. Additional students will be served through AP review
courses that are non-credit and open 60 days before the May College Board AP exams.
Almost one-fourth of Illinois school districts are taking advantage of cable television or satellite broadcasts to expand curriculum opportunities for their students. Nearly 24% of Illinois school districts now report student participation in classes from remote sites via cable TV or satellite; in 1995, only 5% of school districts participated student participation in such classes.

The Illinois School Improvement Website (ILSI) (http://ilsi.isbe.net/) has been cited as an exemplary model by the National Association of Elementary School Principals. ILSI provides student achievement information that allows educators analyze their own school’s performance and compare it with schools of comparable size and characteristics. The website also supports data-driven decisions about school improvement, informs parents and community members about their schools, and provides easy access to a variety of resources and tools related to the Learning Standards.

Illinois has received national recognition for its Assistive Technology programs for students with disabilities (http://www.isbe.net/assistive). In April 2001, the National United Cerebral Palsy Association identified the Illinois Assistive Technology Exchange Network (ATEN) as one of two programs in the country that is providing new, innovative or particularly successful programs for students for students with disabilities.

Illinois was chosen last year as recipient of a $2,250,000 grant from the Bill and Melinda Gates Foundation. The grant, which was sought by a coalition of state education, business and government leaders and is administered through Illinois State University, is part of the Foundation’s commitment to develop strong leadership in education. The program is providing local superintendents and principals with “a timely and comprehensive approach to bringing the use of technology into the mainstream of school administration.” That includes the opportunity to learn how to use technology; how to support the use of technology in their schools; and how to recognize, support and encourage the appropriate use of technology in the classroom.” A special emphasis of the Project training thus far has been on using technology for data analysis and school improvement planning.

At the time the 1995 State Plan was developed, the following elements were identified as strategic actions that would be critical to its success.

- **Balancing state leadership with regional and local decision making to ensure realistic, intelligent approaches to infrastructure, planning, information sharing, curriculum designs for learning, professional development, human resource deployment, change management and funding;**

- **Looking beyond the education community to challenge diverse groups of stakeholders to use their collective will to design and invest in community-based approaches to educational reform;**
• Recognizing that "dollars follow vision" and building the capacity of school districts and local communities to intelligently design and implement learning technology blueprints which stage their communities for success both economically and educationally;

• Ensuring that technology and telecommunications are core building blocks in the redesign of the state's educational system;

• Designing the infrastructure (the boxes and wires) as a critical 21st-century "means" to the real "end" of aligning teaching and learning to a knowledge-based society;

• Building on a three-prong approach to funding based on the state's responsibility to provide equity of educational opportunity, the community's responsibility to invest in services for local citizens, and the district's responsibility to reprioritize existing funds toward improved student learning; and

• Taking a thoughtful, "go slow" approach to change, focusing on highly successful solutions to focused challenges and incorporating into the process sustainability and incremental change, growth, and dynamic, ongoing reviews.

As we look back, we can see that many of these elements were in fact critical to our progress thus far. Overall, many individuals and groups have contributed to the identified accomplishments and many initiatives were important as levers for change. The actions that seem to have had particularly strategic value are listed below and further described in Exhibit I on the following pages.

**Key Strategies Implemented Since 1995**

- Provide leadership and support at the state and regional levels
- Abide by a framework of vision and policies
- Establish regional technology support centers
- Construct a statewide technology backbone
- Integrate technology into student learning standards
- Integrate technology into teacher certification requirements
- Require local, community-based planning
- Target advocacy for technology
- Provide state funding with required local match; distribute to meet goals
- Aggressively pursue federal funds
- Give priority to professional development of teachers
- Provide districts with on-line resources and learning opportunities
- Support collaboration and partnerships
- Collect data and evaluate programs
**EXHIBIT 1**

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<th>Strategic Actions</th>
<th>What Happened</th>
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<td>Leadership and support at the state and regional levels</td>
<td>The Governor and his staff advocated for specific technology goals and programs; The Illinois General Assembly provided state funding for technology line items; The State Board of Education gave continued priority to leadership for technology; and The Regional Offices of Education served as links and leaders between local districts.</td>
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<td>A framework of vision and policies</td>
<td>A common vision and clearly stated policies served as a framework to guide decision-making and actions throughout the five-year period.</td>
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<td>Establishment of Technology Centers</td>
<td>These Centers were strategically located throughout the state and assigned to provide support for local districts. Specific responsibilities included professional development for teachers and administrators, long-range technology planning, network design consultation, support for Internet and distance learning, and providing access to information opportunities. In addition, the staff members in these Centers provided advocacy and expertise for appropriate use of technology in education.</td>
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<td>Development of a statewide technology backbone to connect school districts to the Internet.</td>
<td>Initial development of a technology backbone for Illinois public schools was accomplished by the State Board of Education through its Linc-On project. In 1999, Governor Ryan signed legislation creating the Illinois Century Network (ICN) that basically adopted the LincOn project to provide all elementary, secondary and higher education institutions (as well as libraries and museums) with affordable, reliable, high-speed connectivity. The ICN is governed by a multi-agency board and administered through the Illinois Board of Higher Education (<a href="http://www.wcc.cc.il.us">http://www.wcc.cc.il.us</a>).</td>
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<td>Integration of technology knowledge and skills into the Illinois Learning Standards and the Applications of Learning</td>
<td>This action emphasized the importance of technology knowledge and skills and their relevance to all of the fundamental learning areas. A description of the “Six Essential Learnings” for students in a technological society provided additional guidance about what students need to know and be able to do.</td>
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<td>Strategic Actions</td>
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<td>Inclusion of technology knowledge and skills in the new standards for Illinois</td>
<td>New teacher certification standards adopted by the State Board included general technology standards for all teachers, as well as more specific standards related to the use of technology in each of the certificate content areas.</td>
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<td>Requirement of a local technology plan</td>
<td>School districts were required to develop a 3-5 year plan for local technology adoption, using the “Blueprint for Community-Based Planning.” This requirement resulted in engagement and commitment by local citizens, many of whom had not been previously involved in this type of activity. All local plans have been reviewed by a group of peers and Technology Center personnel before they were funded by the State Board of Education.</td>
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<td>as a condition for state funding; promotion of an inclusive, community-based</td>
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<td>planning model</td>
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<td>Targeted advocacy for technology</td>
<td>Tech 2000, an annual technology demonstration in the State Capitol, has served as a highly visible and effective way to develop legislative understanding and support for the uses of technology in K-12 education. The event has been extremely popular with legislators and it has provided students with unique learning experiences.</td>
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<td>Appropriation of state funds for technology; allocation to meet strategic goals</td>
<td>The State created two funding sources for technology: the “Technology for Success” line which supports grants to local districts and state-level initiatives; and the “Revolving Loan Program” which allows districts to borrow state money to purchase technology. Consistent with the funding principles established in the 1995 State Plan, grants to districts required local commitments and gave priority to high-poverty districts.</td>
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<td>Aggressive and successful pursuit of E-rate and other federal funds on behalf of</td>
<td>Illinois has received substantial amounts of e-rate discounts each year since the program began: $81 million in 1998; $163 million in 1999; $119 million in 2000; and $55-85 million (current estimate) for 2001. Illinois schools have also received $79.6 million from the Technology Literacy Challenge Fund and more than $62 million through the Technology Innovation Challenge Grant (TICG) program. The Illinois total of seven TICG grants is more than any other state except California.</td>
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<td>Priority for professional development of teachers</td>
<td>During the first four years of the state technology grant program, districts were required to devote 25% of their funds to professional development. When the state adopted requirements for certificate renewal, technology was one of the “state priorities” for continuing professional development. The regional centers have trained thousands of teachers and administrators about technology and its uses in the classroom.</td>
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<td>State provision of on-line technology resources</td>
<td>Internet-based resources have been made available to school districts through the State Board website. These have included Britannica, Scholastica, Big Chalk, Electric Library, Classroom Connect, Educational Structures, Chicago Academy of Science, Learning Outfitters and others. The ILSI website provides connections to the Illinois Learning Standards and a variety of supplemental resources, including performance descriptors, model lessons and assessments. In the near future, the website will also provide examples of student work that meets desired performance levels.</td>
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<td>State provision of curriculum projects and learning opportunities</td>
<td>These include the original “Museums in the Classroom” project and the Marco Polo program. The Museum project has been significantly broadened to give all schools access to the full array of museum/cultural resources in the state. The new initiative is called “Classrooms Without Walls.”</td>
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<td>Support for collaboration and partnerships</td>
<td>The State Board has encouraged and supported districts in leveraging their resources. In addition to initiatives such as the Blazing Trails project described elsewhere, the Board funded the South Cook Education Consortium. This project brings together 8 high-poverty districts in a variety of collaborative efforts designed to use technology to better meet the needs of their students.</td>
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<td>Data collection and program evaluation to measure and evaluate progress</td>
<td>The first statewide data collection in 1996 focused primarily on the presence of “boxes and wires.” In 2000, the State Board of Education contracted with Westat to conduct a multi-year evaluation of the use and impact of technology in Illinois K-12 schools. A variety of resources have been provided for local districts to encourage and assist them in continuously evaluating and improving their technology efforts.</td>
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These investments of resources and creativity since 1995 have resulted in significantly increased use of technology at the state and local levels.

The State Board of Education has become a leader and model in using technology to fulfill its mission and responsibilities. The Board now routinely uses technology for communication with local school districts and a wide variety of interest groups (email rather than paper), for advocacy and service (information available on the web and on discs), and management (electronic submission of data and certification applications).

Among the many highlights are the following innovations and applications:

- the ILSI website described above;
- the Illinois Local Education Agency Retrieval Network or ILEARN, a website that provides detailed financial information about each district (www.isbe.net – scroll to ILEARN);
- the new Certificate Renewal Tracking System (CERTS) which allows Illinois teachers to complete online most of the paperwork requirements of the certificate renewal system (isbe.net/recertification);
- an innovative early learning website that provides online assistance to early childhood educators, caregivers and parents of preschoolers. This resource (http://illinoisearlylearning.org) provides the best-researched, most-important information to help maximize children’s early years;
- the new Schools Without Walls web portal that provides an easy-to-use online resource guide and link to museums and cultural institutions in Illinois; and
- the Geographic Information System or GIS, a software program that allows the State Board to link geographical information to almost any kind of attribute data. The GIS program supports data analysis and visualization of patterns, and it has been used to evaluate energy cost trends and help districts define their legal boundaries. A project currently underway is intended to result in an alternative poverty count for the General State Aid formula.

These and many other actions have improved the efficiency and effectiveness of the state education agency, provided services that were heretofore either unavailable to the public, or nearly so (e.g., finding information about the achievement and financial condition of all school districts), and allowed for instant and widespread communication with Illinois citizens. As an example of the latter benefit, individuals with concerns about a pending State Board policy or rule can now provide “testimony” by e-mail instead of having to personally participate in a hearing.

Local districts throughout Illinois have likewise introduced technology into their operations. The following vignettes, written by local and regional educators, provide a window on what is happening in Illinois classrooms and communities.
Like a basketball adeptly passed between players, a single vision traveled between members of the educational team. Students at Niles North High School in Skokie scored big when they traveled to the State Capitol to demonstrate the prototype kiosk they developed and built to meet a real-life need in their community.

The kiosk the students built was initially the inspiration of a group of community stakeholders, who envisioned closer links with the surrounding township as a community-outreach goal. The idea was to provide easy access to information for citizens without Internet access in their homes. The proposed was a network of freestanding kiosks in public places throughout the township to house computer screens and interactive on-line links to the district’s web site, or perhaps a special web site.

As an administrator on the planning team, I picked up the idea and passed it to the Applied Science and Technology Department at Niles North. As the Director of Technology for Niles Township, I saw in the kiosk the basis for an excellent problem-based learning unit, and Engineering Design teacher Ken Albert agreed.

Albert showed his students a video, *The Deep Dive*, which first aired on ABC’s *Nightline* in 1999. It features a California design company that draws on the talents of people from different disciplines to define a client’s need and build an affordable, practical prototype to meet that need.

The students divided themselves into teams to research different aspects of the proposal. Would the kiosks be housed indoors or out? Where would their power source be, and what special wiring needs might there be? What size and shape would make the kiosk inviting and accessible to everyone? What would be the costs and maintenance requirements? They met often throughout the design process to pose new questions and share the results of their research, much of it done online. To prepare drawings, the students used the CAD/CAM equipment in their classroom.

In late fall, the students presented their design to Albert and I, complete with a list of materials and a cost estimate. We were impressed, and soon the materials were purchased and the students set to work. Their deadline was to finish building the kiosk in time for TECH 2000, the annual event held in Springfield to demonstrate to policy makers the importance of classroom technology in preparing students for an information-based society.

In researching, designing, and building the kiosk, the students used technology to help them work as a team and to translate an idea into a reality. The project encouraged communication, promoted the sharing of resources and inspired innovative thinking, bringing together all the elements of meaningful engaged learning that are part of the district’s educational goals.
Engaged learning? Technology integration? These are buzz words that get bandied about regularly by educators across the country and around the whole wired world. But after we teachers have learned and taught how to use computers, digital cameras, the Internet, and whatever comes down the technology pike next, the question remains: What can all of these wonderful things do for our students?

As an “Explorer” teacher in the Blazing Learning Trails (BLT), federal grant program administered by Franklin/Williamson Regional Office of Education #21, I was challenged to find an answer to the integration question that worked for me and my students. BLT gave me technology and engaged learning training, a new computer and software for my classroom, plus graduate credit and a stipend for after-hours work. All I had to do was come up with an idea that combined technology, engaged learning practices, and addressed the state standards for learning.

My solution was the The Vortex, a cybermagazine written and published on the web by the students in my creative writing class. This class is an independent study course with only four senior students who must meet certain standards for admission, so I believed it was a good group on which to practice my experiment. I brought up the idea at the beginning of the school year, and they responded enthusiastically.

One of the first decisions we had to make was what we wanted our magazine to be. The students conducted an extensive web search of high school web projects and found many good ones. There were several student newspapers online, as well as sites that showcased student creativity in writing and art. The students noted the ideas they thought they could incorporate into the project and came up with the idea to combine elements of the online newspaper with a forum for creativity. With a little prodding from me, they cam to see the need to make the articles global and link-intensive. This led to the idea of the cybermagazine, an online publication with no back cover.

The next step was to brainstorm using concept-mapping software Inspiration, which I taught them. The students divided the magazine into four areas—Who we are, What we do, What we know, and What others know—with each of the four taking one area and making a concept map of what type of articles should be included in that category. Specific ideas for articles were then discussed and the first writing assignments were made. Then came the all-important naming of the project: Since our athletic teams are the Tornadoes, The Vortex seemed logical.

After the articles were drafted came the fun part—creating the web site. Since none of the students had experience with web page construction and learning HTML would have been time-consuming, I decided to use web-authoring software. I had become familiar with several of the programs during my BLT training, and I finally chose Web Site Designer because of its graphics and ease of use. The students learned to use the program in just a couple of class periods, and also incorporated digital cameras, scanners, and a photo-editing software program into the site development. Although this project was only part of the class curriculum, on October 15, 1999, The Vortex was first published on the World Wide Web. The Vortex is now online (http://members.Xoom.com/vortexmag/vortexmag/).
Since its launch, *The Vortex* has been updated and edited several times. And while the site has also crashed a few times, we've learned to grit our teeth and reconstruct. We all have concluded along the way that this type of project never is finished, just as *The Vortex* has no back cover. Word has begun to reach students and community members, and *The Vortex* is beginning to attract some visitors. In the week after Christmas break, we were pleased and surprised to learn that we had been chosen as the first “Class Act” of the year 2000 by WSIL-TV, our regional ABC affiliate. The students and I were interviewed and the segment aired on January 4. It was a wonderful honor for a project that was just a few months old.

The students who produce *The Vortex* are proud of their work and remain enthusiastic. They are twisting arms to bring in contributing writers from the student body and are very interested in finding and learning new techniques and gizmos that will make the magazine better. They have found a successful way to combine their creativity with technology. As for me, I am now planning to use the experience and knowledge I gained with *The Vortex* to expand another project that my tenth-grade English students will be doing, “Shakespeare on the World Wide Web.” Watch for us: We’ll be online!

**Access Makes a Difference at Harrisburg Unit #3**

Imagine a turn-of-the-century high school building in which access to an Internet connection and wiring of any kind is at a premium. Now drop into a journalism class that’s determined to make its mark using cutting-edge technology. Sound like a recipe for disaster? Not if those students attend Harrisburg High School.

In September, the Harrisburg Unit #3 Board of Education approved a plan submitted by English and journalism instructor Cathy Sullivan to purchase ten Apple iBooks, complete with wireless networking capabilities. The Airport, developed by Lucent, allows students to access a server and the Internet without the hassle of wires. “It’s actually pretty amazing,” Sullivan says. “Ever since I became adviser to the program, we’ve struggled with the wiring issue. Where do we plug in the computers? How do we add new computers with the limited availability? Don’t get me wrong. The custodial staff and our tech coordinator, Cindy Black, have bent over backward to give these kids what they want and need to operate, but there’s only so much you can do in a building that’s 100 years old. With the laptops, the kids can log on to the Internet or access their server file from any corner of the room.”

Krystal Golish, executive editor to Harrisburg’s student newspaper, *The Purple Clarion*, is a four-year veteran of the program and knows better than any other staff member the difference the technology makes in productivity and quality. “When I started, we had one Centris 610 with a memory boost for layout and three- or four-year-old Mac Classics to be shared by twenty to thirty students,” she says. “Putting the paper together was nothing short of a monthly nightmare. The disks would crash, the computers would crash, and we were so busy fighting the machines we didn’t have time to concentrate on fine-tuning.”
“With the addition of the laptops, everyone has access to a really good machine, plus we’ve eliminated the need for disks because each writer can save his story directly to the server. What’s more, we’ve added portability. When I go to the school board meeting, I check out a laptop. I can word process the notes, take my information home, and write up the story while everything is fresh in my mind. What’s more, I can work on existing layouts or experiment with new looks at home and then bring my work in the next day. It’s unbelievable,” Golish said.

Sullivan, who teaches English as well as advising the newspaper, received an added bonus from the technology purchase. “Journalism is only one-fourth of my schedule,” she said. “I teach honors English III and English IV the rest of the time. With these machines, the student-to-computer ratio has dropped from seven to eight students per Internet connection to two students per Internet connection. Group projects have been absolutely revitalized! They can work in pairs or in groups of five or six students and produce amazing projects.”

As part of her board proposal, Sullivan submitted a syllabus for both English classes that integrated a technology project for each unit of study. The students use the computers for everything from research to presentation. “I want them to see the computers as a means to an end,” Sullivan explains. “So many times, technology projects are focused on the computers rather than on what the computers can help the students achieve. Believe it or not, I have students—and not just honor students, either—begging me to come in early or open up my classroom at night for sessions on the laptops. They are anxious to perfect the look of the presentation or find just one more piece of information or graphic to clinch what we call the Wow! points. Students are enjoying their learning, and I feel access to excellent technology deserves a great deal of the credit.”

Sullivan’s classes aren’t the only ones to reap the benefits of technology. Harrisburg’s schools have a strong commitment to providing their students access to computer technology. As Harrisburg Community Unit School District Technology Coordinator Cindy Black states: “I feel that this pilot program will prove that technology integration into the curriculum is essential. I see the students using the technology to reach their class goals, and it is amazing what they are accomplishing.”

### Leveraging Resources and Working Together to Find Additional Funding Sources

**by Vicki DeWitt**  
*Area 5 Hub Director*

In downstate Edwardsville, Area 5 Learning Technology Hub and the seven local superintendents of the Regional Offices of Education and staff wondered how to do all we wanted to do to help schools integrate technology into teaching and learning practices.

Because almost 100 of the 119 school districts located in this sixteen-county area are ranked among the poorest districts in the state, the group knew we would have to find a large funding source to serve our 177,000 students and 12,000 certified staff, who are scattered over a large geographical area that includes an Empowerment Zone, and large urban and rural populations. The ROEs asked me, the area’s Hub Director, to investigate possibilities for additional funding.
Offering up to $10 million per grant, the federal Technology Innovation Challenge Grants are among of the largest available. The hitch is that only twenty TIC Grants are awarded each year—chosen from more than 400 applicants. Still the writing group consisting of three Collinsville School District staff, two ROE staff, a Southern Illinois University professor, and myself, decided we would try.

We were awarded the grant in October 1998. Area 5 Leaders In Technology Enhanced Schools (LITES) schools now receive an extra $2 million a year to help them become models of technology integration.

I am certain the reason we were able to organize ourselves and successfully write this grant in less than two months was because the Illinois State Board of Education Learning Technology Center, ROEs/ISCs, and Learning Technology Hubs already had created a community-based technology planning process with peer review. All schools were required to complete this process to receive state technology dollars.

It’s because of the training, the planning process, the peer reviewing of these plans, and the conversations that occurred during this procedure that my schools got this large federal grant. Our team already understood the why’s and how’s about integrating and changing the way we support teaching and learning with technology. I just made a few phone calls and the support for writing this grant came pouring into the office. Both the response and the level of understand were amazing.

**Blazing Learning Trails:**

**A Professional Development Model to Improve School Learning Communities**

by Marla Harp

*Director of Technology at Franklin-Williamson ROE #21*

The Blazing Learning Trails consortium adopted the vision enunciated by ISBE in the 1995 technology plan and developed a step-by-step method to reach, achieve, and exceed the professional development goals of the state of Illinois. Active members of the consortium include the state education agency (ISBE), the College of Education at Southern Illinois University at Carbondale (SIU-C), the North Central Regional Education Laboratory (NCREL), many private sector education technology firms, the Franklin-Williamson region’s sixteen public K-12 school districts, two private K-12 school districts, two special education cooperatives, and two alternative schools. Blazing Learning Trails is a federally funded Technology Innovation Challenge Grant that is administered by Franklin-Williamson Regional Office of Education #21, and its superintendent, Barry Kohl. October 2000 marked the beginning of the third year of our five-year project.

The Blazing Learning Trails consortium designed an innovative three-tiered, three-strand professional development model that marries the best current research in effective professional development with high-quality course curriculum and teaching methodologies. This research-based model takes learners from the school learning community (including teachers, administrators, school library media personnel, college of education faculty, pre-service teachers, and school staff) from an initial introduction or “entry” into the use of technology through “adoption, adaptation, appropriation, and innovation” for three main areas of competence: Essential Technology, Engaged Learning, and the Illinois Learning Standards. The model has
been successfully implemented in all sixteen public school districts in the Franklin-Williamson K-12 learning communities, as well as six additional districts in the state.

The consortium, through the professional development model, acknowledges that all learners do not begin with the same technological competence or the same level of enthusiasm. This is why Blazing Learning Trails “corkscrews” its model into effect throughout the community by first retraining those professionals most willing to learn and incorporate new skills (“explorers” and “trailblazers”) and ensuring that these explorers and trailblazers can then mentor the “pioneers,” “settlers,” and “homesteaders” who follow them through the learning process. The model goes beyond technical support (such as how to make machines work when lights blink and screens freeze) to include the need for support in technological integration and pedagogical concepts. It also ensures support for all the extra time required for teachers to learn to work with technology, adapt and become comfortable with the new curriculum, and explore creative techniques for technology integration.

Importantly, the consortium also understands that simply reaching and re-training current teachers through in-service approaches to technology integration is not sufficient. Due to retirement and other attrition, Illinois will need an estimated 80,000 new certified staff during the next decade to maintain staffing levels. As a result, an integral part of the consortium’s effort is directed at restructuring teacher education at the pre-service level. Consortium member Southern Illinois University at Carbondale designed the pre-service portion of Blazing Learning Trails and committed its faculty to the effort.

Thus, we are creating two Learning Trails—one for current staff and one for future staff—that emphasize Essential Technology Skills, Engaged Learning, and the Illinois Learning Standards. According to the Blazing Learning Trails project evaluation, the three-tiered, three-strand professional development model is effective in building the capacity of educators to establish a student-centered, technology-enriched learning environment. The complete three-tiered, three-strand Professional Development Model and the current evaluation report of the Blazing Learning Trails project is available at http://www.blazinglearningtrails.org.

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### TIP Funding at Carlinville Community Unit School District #1

by Gayla Walters  
*Technology Coordinator, Carlinville Community Unit School District #1*

Because we are in the third quartile, we received $99,247 in Technology Improvement Program (TIP) money in September 1998. This money gave us the wonderful opportunity to provide professional development, update outdated equipment, automate our library systems, and initiate a community partnership to share our resources and expertise with one another. Our community is now our partner in the planning process, and our teachers and administrators have benefited greatly from the professional development that TIP allowed.

Because of the written community technology plan, our future plan is in place for several years. This vision provided us with well-developed needs and objectives for several grants. Carlinville has been successful in winning state grants, such as Museum in the Classroom, Pioneering Partners, and ISBE Scientific Literacy grants. TIP monies also provided a great foundation for growth. I believe we were chosen to be a participant in the LITES School (Area 5 Learning Technology Hub’s $10 million Federal Technology Literacy Challenge Grant) because we were prepared for it. TIP allowed us to have the hardware, teacher knowledge and
experience, and community and administrative support necessary to make a federal grant succeed.

TIP monies have truly helped our five schools in Carlinville improve classroom instruction for our 1,700 students in grades K-12. But we can’t stop now. When I was hired as the Technology Coordinator, our superintendent challenged me to create technology monsters that couldn’t get enough hardware, software, and training. Well, several years later we have those monsters, and I see that as a successful milestone for Carlinville students, teachers, and the community. But I fear that technology is moving too fast for our local school budget to keep up. I sincerely hope ISBE will continue to fund the TIP monies so that our community technology plans will become a living document with the resources to make it all happen.

TIP Funding at New Lenox School District 122
by Glenda Fahey
Technology Facilitator, New Lenox

I am grateful for the many benefits the Technology Improvement Program (TIP) grant has provided to our district this past year.

As a rapidly expanding school district, our student population has placed quite a burden on our financial resources, including funding for technology. With the TIP grant, we were able to offset these financial difficulties somewhat and improve our abilities to offer technology and training to our students and staff. For example:

- We purchased new equipment, such as computers, printers, projectors, and scanners, that decreased our student-to-workstation and -to-printer ratio, providing greater accessibility to technology.

- We purchased several much-needed pieces of software appropriate for the district’s eight buildings, helping students with their research, creativity, and productivity.

- We provide more professional development opportunities for our teachers than we have ever been able to do before, with staff members participating in a wide variety of in-house classes, workshops, conferences, online courses, and university courses.

- Our teachers have progressed considerably in their abilities to integrate available technology in the curriculum. The overall results have been apparent in all that our teachers have been able to accomplish both personally and with their students.

- Because of the financial resources of the TIP grant, we have advanced in our efforts to bring our teachers and students into the new millennium. If we can continue to fund technology for our schools in this manner, there are no limits to what we can accomplish.
Students Responsible for Their Own Learning
by Brian Leopold
Physics teacher, Manteno High School

My desire to provide additional resources to my physics students at Manteno High School led me to videoconferencing. Through a $500 grant from Ameritech and Western Illinois University, I was able to purchase teleconferencing equipment.

Because I think that students are more motivated to learn when the task is relevant and authentic, early in the semester I asked my physics class to find something that they would like to learn about. Lasers were the unanimous choice.

After doing some initial research over the Internet, the class refined their interest to a laser light show. They began by creating a list of questions they would need answered. Then the list was organized into different groups based on content and where the students might find the answers to the questions. Sometimes the answers could be found in one of my lectures, other times the students turn to their books, experts on the Internet, or experimentation.

I then separated the class into groups with each responsible for answering a set of questions and presenting the answers to the rest of the class using PowerPoint. When answers could not be readily found, the class as a whole devised experiments that might provide the answers. For example, they wanted to know what would happen if you shined a laser beam on a mirror that was rotating—they wanted to see what effect would be produced on a screen or wall. So class designed their own experiment to answer this question. In fact, they reflected the beam off not just one, but two and then three rotating mirrors!

As the students' knowledge base increased, their questions became more complex, and required more expert advice. Someone at WIU knew a scientist at Sandia National Laboratories in New Mexico who might be interested in videoconferencing. After tinkering with the videoconferencing setup for a while, the first videoconference was held with seven optics scientists. Through the use of electronic whiteboards, these scientists were able to diagram the various lens positions to try, and they were also able to answer students' questions. This was the first of four videoconferences that were held with Sandia.

A fringe benefit to videoconferencing arose during one of our sessions when someone from Buenos Aires saw the discussion online and asked to join the meeting. It turned out that he was a computer teacher at a preparatory school and was eager to videoconference with the Spanish classes.

My students also were interested in what would happen if a mirror was attached to the cone of a speaker. They spent several Saturday afternoons experimenting with different music and an audio mixer to see what patterns they could produce on the wall. They even brought in a fog machine to give the images a three-dimensional effect.

The last step in this educational journey was a debriefing session in which the students and I shared what was learned, what we would do differently, and what questions still remain unanswered. For me, this was the most rewarding part of the project because it showed how much the students had grown over a period of seven weeks. The students made videotapes of the project and the debriefing session at the local cable TV station. This serves to document what they did and whenever I feel discouraged as a teacher, I take a look at it!
Illinois can take justifiable pride in the quantum leap it has made in the use of technology in P-12 education since 1995, particularly in relation to:

- creating partnerships,
- providing leadership,
- building capacity,
- assuring access and infrastructure, and
- guaranteeing funding and accountability.

This review clearly indicates that significant results can be achieved through a plan that is based on a clear vision, has well-designed strategies, and has the leadership and support of key players.
MILES TO GO

Despite the exceptional progress of the past five years, there is still much work to be done toward the goals in the 1995 State Plan. This Section discusses the four goal areas where progress has been slowest, as well as selected other goal areas where our achievements need to be supplemented with additional effort. The analysis is intended to serve as a basis for continuous improvement through the second five-year plan.

**Goal #5 – 1995 State Plan**

*Ensure Equitable Access to Electronic Resources – Ensure students and educators in Illinois public schools have universal, equitable access to networked (on-line) information and resources and the knowledge, skills and context necessary to effectively use such learning tools.*

Two aspects of equitable access are important to realizing the value of technology in Illinois schools: student access to technology and the way in which technology is used by students and teachers.

**Student Access to Technology**

Research and best practice indicate that students need access to a range of technology devices to support their learning. In 1995, the recommended tools included:

- Tools of investigation, supporting scientific and mathematical thinking (science probes, simulations, geometric supposers);
- Tools for gathering information (Internet, CD-ROMs, videodisks);
- Tools for sorting, organizing and analyzing information (databases, spreadsheets, timelines, graphing programs);
- Tools for representing and conveying to others what they have learned (multimedia applications, desktop publishing, graphics programs).

Although the state has not collected data about the types of technology tools that are actually available to Illinois students, anecdotal evidence suggests that

- the stand-alone computer remains the most common electronic technology in the schools, and
- the sophistication of these computers covers the spectrum from low to advanced.

Overall, Illinois has 6.3 students per Internet-capable computer and 5.2 students per instructional computer, both ratios near the research and best practice recommendation of at least one computer for every four or five students.
However, even though computer presence and Internet connections in Illinois schools have increased exponentially during the past five years, student access to technology continues to vary based on the school the student attends.

- Urban, rural and high-poverty districts report much higher student-to-Internet computer ratios than the state average or their suburban and mid-sized counterparts. Chicago schools and high-poverty schools have a student to Internet-capable instructional computer ratio of just 10.4 and 10.5 respectively.

- Students in high-minority enrollment schools also have much less access than their peers to multimedia computers. The ratio in these schools is 11.2, which is significantly higher than the Illinois average of 8.0 for such schools and even higher than the national average of 9.4.

Students per Internet-Connected Instructional Computer

![Bar chart](chart.png)

^Affluent defined as schools where 11 percent or less of students are eligible for free or reduced price lunch  
*Poor schools defined as schools where over 59 percent of students are eligible for free or reduced price lunch  

These ratios refer to computers located anywhere in the school. However, in many schools in Illinois, a majority of the available computers are still located in technology laboratories. When they are permanently placed in the classroom, they are typically available in very small numbers.

- Across Illinois, there is an average of just 1.5 Internet-capable computers per classroom, a ratio that places Illinois in the lowest quartile of states.

- Again, there is a difference between types of schools. The average ratio of Internet-capable computers in the classrooms of affluent schools is 2.0; in high poverty schools, the classroom-based instructional computer ratio is 1.3. In Chicago, the ratio is just 1.2.

Wireless computers as part of a lab that comes to the classroom, rather than vice versa, seem to be a solution to both the computer-student ratio and computer-location...
problems. These problems may also be alleviated when and if hand-held or similar small personal computing devices become widely available in the schools. Some technologists assert that “within five years, every student in the United States will carry a computing device to school.” Unfortunately, both wireless and handheld devices, as well as other similar innovations, will probably come first to affluent schools and affluent students, leaving an even more serious access gap for students in high-poverty schools.

Student and Teacher Use of Technology

Even if students have access to Internet-connected computers in their classrooms in a reasonable ratio, equitable access to technology depends on how that technology is used.

Research indicates that the most powerful effect of technology is achieved – even for high-risk students – when it is used to support problem solving, research, and other advanced learning activities. Technology is least effective for drill and practice or other rote tasks.

The available evidence suggests that there are significant differences in the ways in which technology is used in Illinois schools, with teachers in high-minority and high-poverty schools using it less frequently and in less useful ways. Technology Counts 2001 reported that just 28% of Illinois teachers in high-minority schools are using the Internet for instruction.

Teachers in high-risk schools who are using technology tend to emphasize rote activities such as drill and practice exercises.

The Digital Divide

The pattern of differential access to technology in Illinois holds true for virtually every indicator reported in Technology Counts 2001 and the independent evaluation by Westat in September 2000. Despite the priority given to financially-challenged school districts in the state funding program, a digital divide exists in Illinois between students in high-minority/high-poverty schools and their peers in more affluent/lower-minority schools.

This divide is illustrated in the vastly different opportunities available to middle school students in two elementary districts in the Chicago area. In one district, where families are affluent and largely white or Asian, the students attend schools that are fully wired, have local and wide area networks, multiple computer laboratories and telephone and desktop computers in each classroom. Students often receive homework assignments through e-mail, complete them through Internet research on the family computer, and submit them back to the teacher for electronic feedback. In the second district, where families are typically poor, minority and with a single parent, the computer laboratory is filled with equipment that is at least two generations old. There are no computers or
other technology resources in the classrooms, nor in most of the students’ homes. Technology is simply not a part of the students’ everyday educational experiences.

In its narrative commentary on the status of technology – and particularly the digital divide issue – in the 50 states, *Technology Counts 2001* indicated that

*In Illinois, closing the digital divide hasn’t been a top priority for several years. While the state is in the final year of a $100 million program to put more computers in classrooms, the political and business establishments have focused on achieving other educational goals recently.*

**Goal #4 – 1995 State Plan**

**Support Teaching and Learning Designs for All** – Support technology-enriched designs for teaching and learning which meet educational challenges in new and different ways; enable learners, teachers, schools and communities to experience those new prototypes; and incorporate the best off those innovations into the state education system.

The vision of the first state plan focused on using technology as “the 21st century ‘means’ to the real ‘end’ of aligning teaching and learning in a knowledge-based society.” The plan particularly emphasized the potential of technology to transform the teaching and learning process in ways consistent with cognitive research about how children learn and the values of engaged learning.

There has been a substantial increase in the use of technology at all levels of instruction in Illinois, and many students now participate in technology-based projects that stimulate their interest, teach content in new ways, and support the development of teamwork and research skills. Examples exist across the curriculum and often serve to link several curricular areas.

- **Art and Science** - One of the first *Museums in the Classroom* Projects linked the Urbana School District with Adler Planetarium. Students in the art program chose a project – sundials – and worked with Adler scientists to learn about these timekeeping instruments. They then created a variety of sundial models and represented these on a website. Although this project is no longer in operation, it was a powerful illustration of the way in which technology could be used to expand learning opportunities for the students and teachers involved in the project and ultimately to impact the entire school community. [http://www.isbe.net/vidlib/main/pgmlist/m1060.htm](http://www.isbe.net/vidlib/main/pgmlist/m1060.htm) The “Sue the Dinosaur” program now provides a similar opportunity for students anywhere in the state to work with experts to study the sixty-seven million year old *Tyrannosaurus rex*, even though it is located at the Field Museum in Chicago. [http://www.fmnh.org/sue/vital.html](http://www.fmnh.org/sue/vital.html)
• Science - A very popular project among Illinois districts is the Illinois RiverWatch Project. This stream-monitoring component of the Illinois EcoWatch Network is coordinated through the Department of Natural Resources. “Citizen scientists” collect and analyze data that is used to guide decisions and report on the state of the environment.  
http://dnr.state.il.us/orep/inrin/ecowatch/river/intro.htm

• History and Social Studies – Fifth grade students at Darien School District #61 last year engaged in a locally-developed web publishing project. The focus was a one-room school house – the Old Lace School – that is owned by the local historical society. Working with members of the society, students researched various topics, took pictures and movies to illustrate their findings, and created a website about the old school that expands regular opportunities to tour and learn about the facility.  
http://www.darien61.com/ol/ol.html

• Mathematics, Science, Industrial Arts, Art and Applied Learning – The Mundelein High School Aviation Technology program provides an opportunity for students to experience the ultimate in applied learning and authentic assessment – to actually build an aircraft. Four planes have been completed by students in this technology-rich program, the most recent intended to fly researchers on Alaskan glaciers. An articulation agreement with Lewis University allows students to earn up to nine hours of college credit transferable to any accredited college. Over 1000 students have completed this program, with over 300 students continuing in aviation-related fields. This is the only program of its kind in the country. 
http://www.mhslake.net/div_avi

Although such initiatives are growing rapidly, they are typically limited to a single subject area or curriculum topic and they do not yet reflect a comprehensive transformation of the teaching and learning process.

The previous discussion described the significant differences in technology use between high- and low-poverty schools; however the use of technology by all Illinois teachers remains limited. The Westat study showed that almost half of Illinois teachers are using computers less than twice a month. Westat reported that just over half (57.6 percent) of Illinois’ K-12 instructors who had access to computers were using them more than twice a month.

Technology Counts 2001 reported that two-thirds (66%) of Illinois schools indicate that a majority of their teachers use the Internet for instruction. However, the Westat study reported that only 17.5% of teachers with access to telecommunications/modems indicated that they were using the Internet with their students more than twice per month. In addition, 40.6 percent of teachers who had access reported that they never used the Internet with their students.
The use of technology by teachers is not only infrequent but primarily for routine tasks. Principals participating in the Westat study indicated that at least some (more than one-quarter) of their teachers use learning technologies to create instructional materials/handouts, facilitate or enhance the quality of classroom instruction, or get information or pictures from the Internet for use in lessons. However, the majority of principals also indicated that few or none of their teachers were using learning technologies to develop electronic portfolios or other alternative assessments, provide instruction on specific computer applications, assign homework or correspond with parents.

Teacher reports about their own use of technology were very similar to those of the principals. The most commonly cited technology uses included creating instructional materials/handouts and generating and administering tests. The most common use with students was for drill and practice.

The fact that multiple applications of technology are not in wide use in Illinois schools has significant implications for student learning. One of the important accomplishments of the first five year plan was the integration of technology throughout the Illinois Learning Standards and the Applications of Learning. However, this becomes a moot point if most Illinois students are not being taught to those Standards and the state assessments do not determine whether they have been met.

There are many reasons for the sporadic and inadequate use of technology in Illinois classrooms, including the limited availability of technology that is capable of advanced applications, teachers’ lack of competence and/or confidence in using that technology, and the belief of some teachers that use of advanced technology applications is not feasible for students who lack basic skills in reading and math.

Even motivated and knowledgeable educators often do not use the technology available to them because of other demands on their time and/or because the technology is not considered reliable and there is no readily available technical assistance.

The following chart identifies the views of principals and teachers about the nature and relative impact of selected barriers to the effective use of technology in the classroom.
Percent of principals and teachers indicating that they consider various factors to be moderate or major barriers to incorporating learning technologies. *(Following Principal and Teacher Survey, Milken Report)*

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Teachers</th>
<th>Principals</th>
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<tbody>
<tr>
<td>Competing Priorities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demands of curriculum or mandated tests</td>
<td>56.4</td>
<td>55.7</td>
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<tr>
<td>Lack of time in school schedule</td>
<td>63.2</td>
<td>52.1</td>
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<tr>
<td>Lack of adequate equipment</td>
<td>N/A</td>
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<td>Lack of reliable and prompt technical support or advice</td>
<td>N/A</td>
<td>38.4</td>
</tr>
<tr>
<td>Lack of appropriate equipment</td>
<td>36</td>
<td>36.6</td>
</tr>
<tr>
<td>Not enough staff/help for supervising students’ computer use</td>
<td>N/A</td>
<td>34.4</td>
</tr>
<tr>
<td>Funds not specifically allocated for telecommunications</td>
<td>N/A</td>
<td>33.3</td>
</tr>
<tr>
<td>Inadequate electrical wiring</td>
<td>31.2</td>
<td>32.3</td>
</tr>
<tr>
<td>Inadequate hardware upkeep and repair</td>
<td>36.7</td>
<td>32.0</td>
</tr>
<tr>
<td>Too few telecommunications access in the building</td>
<td>42.1</td>
<td>27.8</td>
</tr>
<tr>
<td>Lack of instructional software</td>
<td>39.7</td>
<td>25</td>
</tr>
<tr>
<td>Problems with telecommunication service providers</td>
<td>27.9</td>
<td>12.5</td>
</tr>
<tr>
<td>Lack of Resources</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Problems with telecommunication service providers</td>
<td>N/A</td>
<td>53.2</td>
</tr>
<tr>
<td>Lack of teacher awareness regarding ways to integrate telecommunications</td>
<td>N/A</td>
<td>53.2</td>
</tr>
<tr>
<td>Lack of adequately trained staff</td>
<td>N/A</td>
<td>45.3</td>
</tr>
<tr>
<td>Lack of technology training for beginning teachers</td>
<td>N/A</td>
<td>35.5</td>
</tr>
<tr>
<td>Lack of teachers’ interest</td>
<td>N/A</td>
<td>19.6</td>
</tr>
<tr>
<td>Software too complicated</td>
<td>14.1</td>
<td>6.2</td>
</tr>
<tr>
<td>Equipment too complicated</td>
<td>20.4</td>
<td>4.9</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concerns about students accessing inappropriate materials on the Internet</td>
<td>N/A</td>
<td>20.7</td>
</tr>
<tr>
<td>Lack of parent or community interest</td>
<td>N/A</td>
<td>5.6</td>
</tr>
<tr>
<td>Use of advanced telecommunications does not fit with the educational policy</td>
<td>N/A</td>
<td>4.8</td>
</tr>
<tr>
<td>Lack of student interest</td>
<td>N/A</td>
<td>1.2</td>
</tr>
</tbody>
</table>

NOTE: N/A (not applicable) refers to barriers not included on the teacher survey.

The report of the statewide planning process emphasized an additional barrier to appropriate use of technology in education – the inherent difficulties in making any significant systemic change. That report indicated that educational leaders need to understand the ever-increasing body of research about change processes and be prepared to use it to transform their own schools.

The story of Prairie-Hills School District 144 illustrates that committed leaders and carefully chosen strategies can overcome barriers and support technology programs that are well-integrated throughout the educational program.
Although its student body is characterized by high poverty and high mobility, the Prairie-Hills Elementary District #144 in south Cook County is committed to ensuring that those circumstances do not stand in the way of high student achievement.

The Prairie-Hills district education plan addresses technology “as a system that {was to be} integrated within all existing structures and not as an ‘add-on’ program.” The emphasis is on curriculum, instruction, assessment, and operations and how technology use can enhance each of these processes.

The district’s implementation of its plan has been systematic. It has taken advantage of state and federal grants to build a state-of-the-art infrastructure, focused curriculum on the engaged learning model, and provided intensive professional development for teachers. It has also taken away the traditional paper “security blanket” and made the use of technology a fundamental operating requirement in the district.

- In 1998, the district rewrote the entire curricula in all seven subject areas. A principal took leadership in each of these areas and worked with teams of teachers to develop curricula that were aligned to the Illinois Learning Standards. This new curricula was not published in a paper format, but is available only online.

- The district selected TIE2000 to publish the curricula online. In 1999, working with the TIE2000 system, the district began to develop quarterly reading assessments for grades 1-8. In subsequent years, the district developed quarterly math and language arts assessments. The district assessment program includes administration of the Terra Nova assessment to all regular education students in grades K-8, as well as quarterly assessment of reading, math and language arts. Technology was used to move all of the valuable data from file cabinets in the central office into the hands of teachers using the student achievement data management system in TIE2000.

- A language arts assessment was implemented this year using an online assessment system provided by EduTest.com. This use of online assessment is reducing the time needed for assessment, providing immediate results and feedback to teachers and students, and improving the overall effectiveness of the district’s assessment program. Plans for next year include moving the existing reading and math assessments into EduTest.com and administering all district assessments online.

- In addition to integrating technology into curriculum and assessment, the district has focused on transforming instruction. Six of the district’s schools are implementing Comprehensive School Reform (CSR) models and by next year, all eight schools will be committed to CSR. Three different instructional models are in use; however, all are tied together through technology. LiveText software is
used for lesson planning, reporting, and analysis of the extent to which the Illinois Learning Standards are being implemented in the instructional design.

- Three years ago, the district initiated the “High Tech Classroom Project.” Individual teachers or teacher teams were invited to write mini-grant proposals that could request additional technology and propose specific instructional activities and assessment practices. Twelve “High Tech Classrooms” have been implemented, providing a forum for innovation by teachers as well as a “demonstration site” that allows teachers “just down the hall” to observe effective technology use by their peers.

- Last year, the district implemented its “Engaged Learning at Prairie-Hills Project” and required that every teacher develop at least one technology-rich unit based upon effective “Project Based Learning practices.” All 108+ teachers posted their projects and student work on the district web site. The project is continuing this year.

- The district has spent an average of $260,000 per year in technology professional development in each of the last four years. Funded through state and federal grant programs, the professional development model used is primarily based on a “trainer-of-trainer” philosophy and focuses on effective use of technology as a tool to improve student achievement. The district relies on internal staff to train teachers, assuring access to help on an as-needed basis.

As a result of its systematic approach, the district

- maintains a ratio of 3 students per Internet-connected computer;
- has moved computers directly into the classrooms rather than in labs or media centers;
- has reduced the number of technical staff required by subscribing to applications through the World Wide Web rather than licensing software (although support for technology remains a major concern); and
- is developing evaluation tools to assess teacher use of technology in the classroom.

Most importantly, student achievement results, especially among students in the “High Tech Classrooms,” show encouraging gains in all subject areas (See discussion on page 52 and/or visit http://phsd144.net/Kozlowski/AASA-SchoolAdministrator.htm)
Goal #6 – 1995 State Plan

*Develop Knowledgeable Educators – Build the capacity of Illinois educators to establish a student-centered, technology-enriched learning environment which results in increased student performance and economic viability.*

Research indicates that teachers are the most critical school variable in student achievement, and that teacher training for technology is the most critical variable in effective technology integration. To this end, national standards indicate that districts should plan to spend at least 30% of their technology budgets for continuous training and retraining of staff. These standards also emphasize the need to assure the intensity and quality of technology training, as well as continuing support for teachers in the classroom.

When the 1995 Plan was developed, relatively few teachers had even the rudiments of technology expertise. Since that time, the State has used a variety of strategies to build capacity among teachers. These strategies have included

- a requirement that at least 25% of each district’s state technology grant be dedicated to teacher professional development,
- funding for regional technology centers to provide professional development training for teachers and other educators, and
- providing an incentive for teacher participation in these learning opportunities by including “technology” as one of the five “state priority” areas for certificate renewal.

These strategies have been generally successful in linking teachers to technology professional development. Principals participating in the Westat study indicated that most of their teachers had participated in technology training in the 12 months preceding that survey.

However, the training provided reportedly addressed skill training to a much greater extent than the integration of technology into instruction. Moreover, participants in the statewide planning discussions described professional development for technology as typically short-term, removed from the teachers’ classrooms and lacking in continuity and follow-up activities. Teachers indicated that when they try to replicate what they learn at such a seminar or training, they are often frustrated by a lack of support or reinforcement. They then return to their familiar teaching behaviors.

The information we have about the technology competency of Illinois educators is mixed, but it generally suggests that there is still much to be done to give them the competence and confidence they need to use technology effectively in their classrooms. According to *Technology Counts 2001*, 31% of Illinois schools report that the majority of teachers are “beginners” when it comes to using technology. In high-minority enrollment schools, 42% of the teachers are “beginners”. This statistic is consistent with the Westat report that indicated that principals in high-poverty schools were less
likely to report that their teachers had received any type of technology professional development training.

A number of local school districts have begun to implement systemic incentives for their teachers to obtain technology training. These incentives include computer purchase programs for teachers; addressing teacher effectiveness in using technology in instruction as a component of teacher evaluation; requiring technology training as a condition for movement on the salary schedule; and providing well-planned technology training and continuing support within the district.

The pace of technology change makes it imperative that teachers receive, in the words of one technology advocate, “a continuous low-level barrage” of technology training. Given this continuing need, as well as the importance of professional development to the quality of technology integration, some educators have questioned why the State Board recently eliminated the requirement that at least 25 percent of the state grant be spent on professional development. That decision was based on the belief that, since all districts have now developed a learning technology plan, they should be able to allocate funding to respond to local needs and circumstances. However, they must continue to address technology professional development as part of their overall plan, and the State Board must have assurance that professional development is not being ignored in favor of boxes and wires.

**Goal #7 – 1995 State Plan**

*Require Technology-enriched Teacher Preparation – Ensure that new teachers are prepared to take full advantage of the learning potential of technology and telecommunications.*

One of the important accomplishments resulting from the 1995 Plan was the State Board’s adoption of technology standards for certification of all new teachers in Illinois. Beginning in the fall of 2001, these new requirements were incorporated into the review process for accreditation of teacher preparation programs, and they will be part of new state assessments for certification that will begin in July 2003.

These state actions are expected to significantly increase the pressure on teacher preparation institutions to provide appropriate training for teacher candidates. Most of these institutions have not made technology training a priority in the past, and they have been criticized for providing technology training that is fragmented and unconnected to classroom experiences. Few instructors have modeled the integration of technology in their field of knowledge, and technology has not been considered an essential component in teacher candidates’ field experiences.

Acknowledging the challenge inherent in building institutional capacity to meet the new technology requirements, the Illinois Community College Board, the Board of Higher Education and the Illinois State Board of Education have formed the **Illinois Consortium for Preparing Tomorrow’s Teachers to Use Technology.** This consortium will receive
$472,820 in federal funds over the next three years for a plan that will address the following goals:

- Integrate technology into the four core academic areas of the post-secondary general education curricula;
- Develop an innovative technology application seminar for potential teacher candidates;
- Enhance the teaching capabilities of post-secondary faculty through a technology-infused professional development program; and
- Develop P-16 technology partnerships to provide support for pre-service and beginning teachers.

No information has been collected yet about the plans of individual colleges and universities to assure that beginning teachers are prepared to effectively use technology from the time they enter the profession. Informal conversations with representatives of teacher preparation programs suggest that they recognize this as an area needing significant attention.

The Westat report observed that younger teachers are using technology more frequently and with greater confidence than more experienced teachers. Most of them have grown up with technology such as video games, cell phones and computers in the dorms, and they are not intimidated by it. This bodes well for the future, as teacher candidates increasingly reflect the digital generation. However, even the most technology-literate teacher candidates will need guidance if they are to make appropriate and effective use of technology in their teaching. The challenge is to make certain they receive that guidance.

**Goal #9 – 1995 State Plan**

**Guarantee Funding and Accountability – Consider funding for learning technologies as the joint responsibility of the state, school districts, business and local communities. Such funding/support should be aligned toward a common vision and contingent upon meeting established benchmarks, standards and protocols.**

In its 1995 Technology Plan, Illinois recognized that even though funding alone could not guarantee results, it was crucial to success. Thus, the State has provided dedicated funds, matched at the local level according to a grant index, that have been instrumental in helping schools throughout the state gear-up relatively quickly.

Illinois faces five important funding issues as it transitions from the 1995 State Plan to a new phase of technology growth and development: (1) continuation of designated state funding for technology; (2) timing and priorities for state grants to districts; (3) the level of state funding needed for the future; (4) funding for the Illinois Virtual High School; and (5) comprehensive budgeting for technology costs.
Designated State Funding for Technology

Since 1995, the State of Illinois has provided more than $347 million in state funding for technology through the Technology for Success and Technology Revolving Loan Fund programs. This support has been critical to the progress made at the local level, and there is no question that continued state funding is necessary to assure continued progress.

However, Illinois legislators increasingly favor large block grants that give districts flexibility in the use of their funds and want to move in this direction. In this context, it is appropriate to ask whether technology funding should continue as a separate funding stream.

State funding for technology was essential in 1995 to offset significant new costs and serve as an incentive for local investment. The use of a separate line item for that funding, along with specific conditions for local grants, assured that the state funds were used for the intended developmental purposes.

At some time in the future, technology may be so well integrated into the schools that it would be appropriate to fund it through either the general state aid formula or one of the large block grants (e.g., the School Safety and School Improvement Block Grant program). However, Illinois has not yet reached that stage and designated funding seems imperative for at least another five-year cycle.

A related question pertains to state funding for the Illinois Century Network (ICN). Funds for the operation of the ICN, which totals approximately $30.8 in FY02, come from the State Board, E-Rate and the Board of Higher Education. Although this is a workable strategy, better accountability would be provided through a single appropriation for the Illinois Century Network rather than transfers of current dollars from the existing fund sources.

Timing and Priorities

When the first four-year cycle for state technology funding (known as the “Technology Integration Program” or TIP) came to a close, many school district representatives requested a more frequent funding cycle. Some believed that a yearly TIP-style funding program would be optimal; others suggested that a more realistic tactic would put schools on an every-other-year cycle and allow them to spend those funds over two years. This would allow schools to use professional development funds for training over the summer.

The recommendation from the statewide planning process for a two-year funding cycle has been accepted by the State Board of Education and is being implemented for the first time during the 2001-2002 school year under the name “Closing the Gap.” However, state agency policies for all grants have not yet been modified to allow district expenditures over two school years.
The new funding cycle has continued to give first funding priority to poorer school districts. All districts except Chicago (which receives a fixed grant of $2.5 million) have been divided into two groups according to district wealth, with the poorer half of Illinois districts receiving funding this year and the other half to receive funding in 2002-2003.

Districts in the first group are receiving $20,000 each, plus $50 per student. These districts are required to provide matching dollars based on a grant index. No decision has been made about the formula for the second group. In part, this will be dependent on the level of funding received from the General Assembly. However, the State Board must also address the critical questions of whether the distribution should promote equity of access to technology by high-poverty schools and whether, as some have suggested, the state should use some of its grant funds to stimulate innovation or “lighthouse” integration of technology in Illinois schools.

Level of State Funding

Most Illinois school districts report that their technology efforts are largely dependent on “soft” money sources such as state and federal grants. Although these districts have made local investments to match, and sometimes exceed, their state grants, they emphasize that the cost of sustaining, replacing, and/or adding new technologies and the personnel to support those technologies far outweigh their ability to fund it with local dollars. A significant number indicate that even with state and federal funding, they have not been able to fully implement their local technology plans.

Soft-money sources are now in jeopardy as a faltering economy and other demands draw away resources. However, even before these uncertainties, the per-pupil expenditures for technology in Illinois were behind per-pupil expenditures in other states with large student populations. Illinois spent $49 million dollars on educational technology in FY2001, or approximately $25 per enrolled student. This is considerably less than states such as New York ($34 per enrolled student), Georgia ($46 per enrolled student) and California ($74 per enrolled student).

Moreover, state funding for technology has leveled out. In the early years of the 1995 Plan, appropriations showed significant increases. Beginning in FY99, however, the amount of the increases declined and in FY02, the appropriation was the same as FY01.

- FY95 - $ 5,000,000
- FY96 - $15,000,000
- FY97 - $30,000,000
- FY98 - $43,750,000
- FY99 - $46,250,000
- FY00 - $48,750,000
- FY01 - $49,250,000
- FY02 - $49,250,000
According to the Metropolitan Planning Council’s draft white paper:

*Over the past three years, general fund spending on education grew 12 percent with General State Aid (GSA), which provides flexible state aid to schools, growing 8 percent. Technology appropriations, as represented through Technology for Success, grew only 1 percent during that same period. With the exception of FY98, growth in Technology for Success funding has continually been less than growth in total general education funding in Illinois.*

The paper suggested that

*With major disparities between Illinois districts in terms of basic technology infrastructure and significant needs in improving professional development and effective uses of technology in the classroom, it is important that funding for technology programs continue to grow if technology investments are to provide the returns of helping students meet the Illinois Learning Standards.*

Continued level funding for technology by the state, or even a modest growth in state appropriations is unlikely to be sufficient to ensure that schools can expand technology into every classroom, adopt new technologies as they are developed, provide on-going training for teachers and ensure the availability of technical support. The Metropolitan Planning Council draft report suggested that

*…in the short term, state funding for education technology [should] grow at the rate of general funds….In the long term, ISBE must determine the level required to support education technology, what the funding will be used for…and viable sources for funding.*

**Funding for the Illinois Virtual High School**

Illinois has made a commitment to provide high-quality e-learning opportunities to P-16 students throughout the state. However, the funding provided so far has been limited in comparison to other states that have moved in this direction. Arizona has spent $23 million for K-12 online learning; Michigan has appropriated $18 million for 9-12 secondary and dual credit programs; and Florida has committed $8 million for K-12 online instruction. The Illinois program has been supported by just $1.8 million and that has been “cobbled together” from sources such as Goals 2000, Scientific Literacy, the Technology for Success program, and a federal grant to support Advanced Placement course reviews. The future of the IVHS as a viable strategy for providing equal and rich learning opportunities for Illinois students will depend on finding a way to provide sufficient and reliable funding.
Comprehensive Budgeting

Gearing up for the integration of technology in the schools is merely the beginning of an on-going process of updating and redeploying equipment, training education personnel, assuring infrastructure support, and evaluating progress. These activities are crucial to the viability of technology use in teaching and learning, and they require continuing, adequate and equitable funding.

However, many districts have viewed technology as a one-time expense, planning and budgeting only for the acquisition cost of hardware and software. That is estimated at just twenty-five percent of the lifetime cost of technology integration.

During the statewide planning process, many participants identified long-term budgeting issues that are now inhibiting their progress. Their concerns focused on three problem areas: 1) support for the technology user, 2) infrastructure capability and 3) upgrading of systems and software.

*Technology Support* - Teachers and other local educators are increasingly concerned about the problems they face in relation to support for local technology systems. Educator proficiency, confidence and desire to integrate technology into the classroom are largely irrelevant if the equipment is not in working order or if there is no one to help resolve problems. In many districts, the teacher who has the most knowledge about technology has become the “technology coordinator” and this assignment is often an “add-on” to other responsibilities. Most educators now believe that they need knowledgeable staff who can give priority to supporting the integration of technology in their schools.

However, they also believe that at least two different skill sets are needed -- technical expertise to manage the system and keep things working, and educational expertise to assist teachers in making best use of the technology in the classroom. These skilled positions usually represent additions to district budgets. Moreover, many teacher salary schedules are not competitive in an economy with a strong demand for technology specialists, even those who only have a high school diploma. A beginning teacher may start at $26,000 while a high-school graduate with strong technology skills may start at $32,000, or more. A number of districts are beginning to contract with commercial network companies for technical support and/or system management services.

*Technology Infrastructure* - Although significant progress has been made in developing an infrastructure for technology within each district in Illinois, there are still many buildings that cannot adequately support digital technology. Teachers and administrators claim that in many older school buildings (as well as some newer ones), there are insufficient electrical outlets, limited phone lines, and not even enough space to put the computers in a classroom. Respondents to a 1999 State Board of Education survey regarding infrastructure needs
identified “technology infrastructure” as their greatest need second to “health/life safety work.” Although “wireless” technology is expected to gain increasing use in the next several years, it also requires infrastructure adaptations.

Illinois’ Technology Revolving Loan Program (http://www.isbe.state.il.us/learn-technology/loan.htm) has been helpful in allowing districts to borrow money from the state to address their infrastructure needs. A new federal program, the School Renovation, IDEA and Technology Grants, will also provide funding for school districts to make technology infrastructure improvements. Illinois has received $42,603,249 for the three aspects of this program, and State Board grant procedures are being structured to assure that the technology grants are linked to those for school renovation. This program specifies the criteria for allocation, with 75% targeted for poor and rural districts.

Technology Upgrades – Schools need to continuously upgrade their systems and their software in order to take full advantage of the power of technology for their students. This is, however, a costly and frustrating process if it isn't anticipated as part of the budget and the overall integration of technology in the educational system.

The “Total Cost of Ownership” (TCO) program is a comprehensive budgeting model that includes all of the costs involved in operating networks and computers, whether leased or owned. It is traditionally used by businesses to help control costs and make strategic decisions. In the education environment, a better understanding of TCO can help school officials do better budget planning and make smarter choices when they deploy a network. This model anticipates that after a district has purchased computers and installed a networking infrastructure, it will have to make major decisions about expenditures for professional development, support, connectivity, software, replacement costs and retrofitting. The Consortium for School Networking website provides additional information about this comprehensive budgeting approach (http://www.cosn.org/tco/).

Goals 1-3 and 9 – 1995 State Plan
Planning and Accountability

The community-based planning required for development of local technology plans has been described as one of the keys to Illinois' exceptional progress during the past five years. However, with the original three- to five-year plans beginning to expire, some districts have suggested that it is both inappropriate and burdensome to conduct such planning in isolation from other, more comprehensive planning requirements – particularly, the local school improvement plan. The similar components of each of the planning efforts results in redundant data collection and overall, the process makes unnecessary work for already over-extended administrators, teachers and citizens.
The final report of the statewide planning process recommended that the community-based technology planning process be continued “until an integrated school improvement planning process (SIP) is designed.” However, the report also indicated that even when the technology and school improvement plans are integrated, “there should be a concerted effort to maintain the integrity and funding of each process.”

The statewide planning process also focused on the need to better integrate state-level school improvement initiatives. Several recommendations emphasized the need to consider the role of technology in relation to all agency initiatives – e.g., mathematics and reading improvement, early learning, and teacher professional development – and urged the State Board to ensure that technology is appropriately reflected as these initiatives are implemented.

The recommendations from the statewide planning process also supported expanded use of diagnostic, formative and summative technology evaluation tools to help schools and the state make data-driven decisions about their efforts. Since 1995, Illinois has established a strong record in this area, including the multi-faceted Westat evaluation. This year, the State Board is launching two additional evaluation initiatives. The first is an independent evaluation of the regional Technology Learning Centers, their role, effectiveness, and future needs. The second initiative is designed to assist districts in collecting meaningful data that can be used in evaluating progress, reporting to their communities and developing the next local technology plan. The “Illinois NextSteps” data program has been developed in collaboration with NCREL/NCRTEC (http://www.ncrtec.org/pe/next/next.htm) and it will soon be provided to districts throughout the state. The thirty-three data collection tools are designed to help them answer the question, “so what?”

The policy question facing Illinois is whether its data collection and evaluation activities are sufficient. The draft report of the Metropolitan Planning Council urged the State to establish technology benchmarks based on best practices and regularly collect and report data from districts in order to measure and evaluate progress. That report also suggested that schools should be evaluated on their technology integration progress and that this evaluation should be included in Illinois’ school report card for stakeholders.
KEEPING UP WITH THE FUTURE

This Section discusses several issues that emerged from the review process, issues that reflect new opportunities and challenges for the State of Illinois. Although these issues were given some attention in the 1995 Plan, they have now become sufficiently important that they need to be given center stage in the planning and policy development process.

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The Illinois public schools will enable all students to succeed in post-secondary education and career opportunities, be effective life-long learners, and participate actively in our democracy.

In September 2001, the State Board of Education adopted this statement as the vision for Illinois education in the 21st century. Although it is a vision that reflects the traditional responsibilities of public schools to prepare students for adult life, it focuses on a future that is expected to be profoundly different from the future for which we and our parents and grandparents were prepared.

The demands of an Information-Age, global economy increasingly require that individuals acquire advanced education or training throughout their careers. In the 21st century, it is no longer sufficient to prepare young people for college or the workplace; they must have the foundation to succeed in both arenas, often simultaneously.

Moreover, the knowledge and skills that young people will need in order to lead successful and productive lives in the 21st century are expected to be vastly different from that needed in the past. Most adults have already been profoundly affected by exponential growth and rapid obsolescence of knowledge and by instantaneous, worldwide communication. According to Educational Research Service, these and other trends suggest that in the future:

- social and intellectual capital will become the primary economic values in society
- continuous improvement and collaboration will replace quick fixes and defense of the status quo;
- knowledge creation and breakthrough thinking will stir a new era of enlightenment; and
- scientific discoveries and societal realities will force difficult ethical choices.

In such a world, young people will need to develop skills in accessing, analyzing, evaluating and using information. They must know how to engage in critical thinking, to work collaboratively with others and to solve problems, often in creative and breakthrough ways. They must understand that learning is a continuous, life-long...
commitment, and they must be willing and able to continuously expand and modify their personal knowledge and beliefs.

The challenges facing America in the 21st century give particular urgency to ensuring that our leaders are able to make wise and ethical decisions and that all citizens can and will be thoughtful and engaged participants in our democracy. Each person must be capable of helping to shape the world, not simply reacting to it.

*Preparing young people for this future will require a substantial change in our traditional education system, a change that transforms what, where, when and how students learn. Technology represents a unique and extraordinary resource that, if appropriately used, can help bring about that transformation. Technology has the potential, if appropriately used, to help us meet critical educational goals, including expanded learning opportunities, equitable student access to those opportunities, improved student achievement, and universal development of 21st century “basic skills,” e.g., critical thinking, problem solving, accessing and applying information, and working collaboratively.*

**Implications for the Vision of Technology in Education**

The vision for the 1995 State Technology Plan focused on the student as learner in today's complex and technologically-based environment. The educators, parents and citizens who participated in stakeholder meetings as part of the statewide planning process discussed this vision and concluded that it remains valid and important. However, they indicated that the vision for the next plan must also focus on the promise of technology to equalize opportunities for all Illinois citizens.

Equality of opportunity has long been the American dream, but the reality was restricted by geography, economic resources and other barriers. At the turn of the century, the “window on the world” for students in a one-room school in deep southern Illinois was typically limited to the teacher’s personal experiences and the books available for students to read. The window wasn’t a great deal wider at mid-century, although the advent of television was beginning to break down the boundaries of time and place.

Late 20th-century technology has completely shattered these previous limits, making it possible to access unlimited amounts of information and to communicate with almost anyone, anywhere in the world and in space. Technology has changed virtually every aspect of our lives, including our relationships with one another.

Few can envision where these circumstances will ultimately take us. We can see, however, that technology makes it possible for anyone, anywhere to be an active participant on the world stage. We can also see that the unprecedented and unlimited possibilities of technology represent both a promise and a threat. They are a promise for those who have access to technology and know what to do with it. They are a threat for those who do not have such access and knowledge, and who are perhaps more disadvantaged than ever because the stakes have changed.
In this environment, schools must provide a new service to the public. They are a key venue for assuring that all young people have access to the technology that will in turn give them access to the world. Technology can only be equalizing in the larger sense if every individual has equal access to this special keycard.

These observations led the participants in the statewide planning process to state as their vision:

*We as learners know that effective technology use is a great equalizer that expands learning expectations, elevates life goals, overcomes barriers, and promotes contributing citizens.*

A similar view was expressed by the NASBE e-learning study group.

*The Study Group firmly believes that the most valuable benefit of e-learning is its potential to deliver high-quality instructional services to all students regardless of location, family or cultural background, or disability. Assuring universal opportunity is a critical policy foundation.*

**Implications for the Education System**

Much has been written about the potential of technology to transform teaching and learning. For the most part, these discussions emphasize a learning process that has characteristics such as the following:

- **Children are engaged in authentic and multidisciplinary tasks.**
- **Assessments are based on students’ performance of real tasks.**
- **Students participate in interactive modes of instruction.**
- **Students work collaboratively.**
- **Students are grouped heterogeneously.**
- **Students learn through exploration.**
- **Teachers are facilitators of learning.**

This is a legitimate goal and it must continue to be at the forefront of our efforts to transform the Illinois educational system. However, this approach has typically been seen as a replacement for traditional education *in traditional settings*. Within the past five years, the old parameters of place-bound schooling have been broken by the emergence and increasing use of technologies that allow learning to occur at any time and any place, using any learning path and moving at any pace.

Although the education system has not yet fully embraced these opportunities, new structures and formats are beginning to emerge in Illinois that take advantage of new capabilities for electronically-delivered learning (e-learning). These include the:
The fledgling Illinois Virtual High School, which is in its first full semester of operation, has already demonstrated the potential power of e-learning. IVHS is providing the Calculus and Mathematica Program from the University of Illinois, allowing students to earn dual credit at their high school and at the higher education institution. An instructor from the Illinois Math and Science Academy (IMSA) is teaching a physics course and an IMSA-delivered physics course is being developed. At some point in the not-too-distant future, it should be possible for students of any age to access learning opportunities that align to their academic interests and skills rather than just those courses provided at their grade level or in their school curriculum.

Public schools throughout the state are beginning to take advantage of e-learning from an ever-growing variety of sources, to either supplement their respective curricula or meet other needs, including space problems. Some have formed partnerships with their neighbors to “virtually” share educational programs, and the Illinois Large Unit Districts Association (LUDA) is developing its own virtual high school, with plans to emphasize programs that meet the needs of at-risk students.

Many parents who provide home schooling are also using e-learning, either as a supplement to or the basis of the educational program provided for their children. Illinois does not yet have a “cyber-charter school” but these are emerging in several other states and we can probably expect a proposal for such a school at some point in the future.

The opportunities provided by new technologies are also being used to support and enhance teacher education and professional development.

- Western Illinois University has agreements with Dallas City and Springfield that allow teacher candidates to “virtually” observe real-time teaching situations and “talk” about teaching and learning issues with both the college instructor and the district teacher. In Dallas City, a highly-skilled early childhood teacher is web cast six hours a day, every day, making it possible for parents as well as teacher candidates and professors to observe the classroom at any time they wish.
The University of Illinois at Urbana-Champaign and the area’s Regional Office of Education have developed a statewide mentoring system that uses electronic conferencing to support and supplement the regional induction program for beginning teachers. Because mentors can be located anywhere in the state, it is possible to closely match the instructional focus of the mentors and novice teachers.

The State Board of Education is preparing a series of streaming video modules, complete with assessments of learning, to help teachers meet new certification requirements resulting from the Corey H. case.

These examples are sufficient to suggest that the traditional mold of schooling is breaking. No one expects that schools as we know them will disappear – students need to have face-to-face interaction in many learning situations, they want to engage in social interaction with their peers, and their parents have very real needs related to the care and safety of children. However, through technology, the limitations of the traditional educational system are being transcended in ways that most of us could not have imagine a decade ago.

Through technology, we have the ability to make any extraordinary array of high-quality learning opportunities available to all Illinois students, regardless of where they live or attend school. Through technology, we have the ability to share the excellent teachers who serve throughout our state. As the NASBE report on e-learning noted:

"Successful learning no longer depends on the random good fortune of always being assigned to the classes of master teachers...Instead, high-quality instruction in almost any given subject can be made available to any student of any age and any background."

Technology is a vehicle with unique and unprecedented power to help us meet the goal of equal opportunity for all Illinois students.

E-learning also addresses the pervasive problem of time. We are learning that virtual teaching and learning do not necessarily take less time than the traditional model – in fact, they make take more. However, in e-learning situations, time becomes much more flexible and the learner and the teacher are liberated from the normal constraints of a 50-minute class period.

The NASBE report on e-learning concluded that “e-learning will improve American education in valuable ways and should be universally implemented as soon as possible.” However, the NASBE report also warned that policymakers must guard against overstated idealism or naiveté.

Certainly, there are many challenges inherent in moving schools toward both “engaged learning” and “any time, any place, any path, any pace” learning. The policy issues are and will be significant, ranging from details like attendance and grades and traditional
demarcations between elementary, secondary and post-secondary education to funding and accountability and quality (see www.nasbe.org). Perhaps most critical will be the issues related to assuring equity of access to the technology on which all else depends.

Two realities compel us to accept these challenges and begin to systematically break the mold of the current educational system.

- E-learning provides an opportunity to meet our cherished dream of equal educational opportunities for all students – a dream that is an imperative in the 21st century.
- Changes are going to happen with us or without us.

Implications for our Expectations for What Students Need to Know and Be Able to Do

As time and technology march inexorably forward, the issue has become not simply helping more students reach a higher standard of achievement in today’s curriculum, but helping all students develop the higher-order cognitive, affective and social skills necessary to function in the 21st century. Chris Dede, a futurist chosen by the Council of Chief State School Officers to coordinate the papers for its 2000 State Education Technologies Conference, wrote that these higher-order skills...include “thriving on chaos” (making rapid decisions based on incomplete information to resolve novel situations); the ability to collaborate with a diverse team – face-to-face or across distance – to accomplish a task; and creating, sharing and mastering knowledge through filtering a sea of quasi-accurate information.

A number of technology leaders and organizations have focused on the unique skills that will be needed for success in the 21st century. David Thornburg, PBS commentator and well-known technologist/educator, has recommended this succinct list of “foundational skills” for students and teachers:

- Know how to find information,
- Know how to determine if what is found is relevant to the task,
- Know to determine if the relevant information is accurate.

The CEO Forum has proposed this list of expectations.

- Digital Age Literacy

  Basic, Scientific and Technological Literacy
  Visual and Information Literacy
  Cultural Literacy and Global Awareness
- **Inventive Thinking**
  - Adaptability/Managing Complexity
  - Curiosity, Creativity and Risk-Taking
  - Higher-Order Thinking and Sound Reasoning

- **Effective Communication**
  - Teaming, Collaboration and Interpersonal Skills
  - Personal and Social Responsibility
  - Interactive Communication

- **High Productivity**
  - Prioritizing, Planning and Managing for Results
  - Effective Use of Real-World Tools
  - Relevant, High-Quality Products

Cheryl Lemke has used this list to design a model for a “high performance school system” for NCREL and linked this design to the 21st century skills and standards proposed by others ([http://www.ncrel.org/engauge/skills/skills.htm](http://www.ncrel.org/engauge/skills/skills.htm)).

Unfortunately, by whatever name, we have not yet given sufficient attention to these new learning needs. We do not teach these skills to all students (particularly not to those who are high-poverty, high-risk), we do not assess their existence, and – with respect to technology skills – we frequently suggest that the skills themselves are not important.

The Illinois Learning Standards and the Applications of Learning remain strong and visionary statements about what students need to know and be able to do. The “Six Essential Learnings” developed as part of the 1995 Plan remain viable descriptors of the technology capabilities needed to function effectively in a technological world. However, we need to give them greater prominence or adopt some other clear set of expectations if we are to achieve the vision of education in the 21st Century. We also need to give them credence by ensuring that they are assessed.

**Implications for Student Achievement**

The extent to which the use of technology has a direct effect on learning achievement is often debated by legislators and others who want to know the return on investment. Research is generally positive about the relationship between technology and achievement. For example, West Virginia has experienced across-the-board increases in statewide assessment scores in basic skills. There have been no large-scale studies of the effect of technology on reducing achievement gaps, but a New Jersey study offered promising results among Hispanic students from low-income families.
The Prairie-Hills district in south Cook County has evidence that the use of technology has had a positive impact on its students. The team of fifth-grade teachers who participated in the “High Tech Classroom” project raised student achievement scores significantly in reading and math, as evidenced on the Terra Nova and ISAT assessments. Analysis of all of the district’s “High Tech Classrooms” indicated that students participating in these classes scored higher at each grade level on the district’s local reading and math assessments than students that were not in “High Tech Classrooms.”

The issue is not whether there can be a relationship between the use of technology and achievement, but whether technology is being effectively used to redefine the learning environments that support and enhance student achievement in a classroom, a school, or a district. The evaluation of technology’s impact on achievement should not be addressed in isolation of the overall teaching and learning opportunities for each student.

**Implications for Going Where the Puck is Going to Be**

Wayne Gretzky, the NHL’s all-time leading scorer, explained that he was able to score so many goals by stating, “I skate to where the puck is going to be, not where it is.”

This concept should continuously guide and challenge our efforts. However, technology changes occur so rapidly that few can anticipate the opportunities and applications that will be available within even the next five or ten years.

The January-February 2001 issue of *Technology Review* described “10 Emerging Technologies That Will Change the World.” These technologies included several that seem to have implications for the schools, including the development of “flexible transistors” that may “open the door to affordable wall-sized display or high-quality displays that pop out of your pen,” and “data mining” which allows organizations to receive data-based answers to questions that weren’t even asked. However, any of these ten emerging technologies, as well as many others, may become vital parts of our future. It is simply too soon to know.

We do know, however, that technology will continue to evolve at breathtaking speed and that will continue to have implications for every aspect of education. The challenge we face is assuring that we use the best of technology innovations for the benefit of Illinois students. To do that, we will need to stay abreast of these innovations as they occur, anticipate how they might benefit students and impact our schools and ensure that the educational system takes advantage of those that have the most promise.
We also need to analyze the unforeseen consequences of technology developments, even those that are available as toys or games. For example, the “Leapfrog” commercials appearing on many television channels during the 2001 holiday season demonstrate the technology-based learning opportunities available to very young children. However, they also illustrate how a family’s financial ability to acquire such devices can create a digital divide well before children enter school.

The educational system probably cannot be ahead of the puck in its use of technology, but the schools should never again be in the position of accepting out-dated computers from local businesses. Our system must ensure that the full power of technology is available to all Illinois students, and to do that, we must make a conscious effort to work with those individuals on the “cutting edge.” We must engage them in helping us learn about emerging technologies, in evaluating their educational potential, and in acquiring and using those new technologies that appear to have the greatest benefit for Illinois students and schools.
MOVING FORWARD

“We must prepare learners for their future, not for our past.”
(from David Thornburg)

The 1995 State Plan for Information Technology in K-12 Education provided an exceptional platform for systematically introducing technology into Illinois schools and using it to improve the education of Illinois students. Thanks to the hard work of thousands of educators and citizens throughout the state, Illinois has made remarkable progress, particularly in establishing partnerships, developing local technology plans, expanding technology access for students and teachers, and creating an infrastructure that includes two state funding streams and a statewide backbone for connectivity.

The statewide planning process confirmed that much of the 1995 Plan remains valid and should be reflected in our plans for the future. That includes goals whose continued progress is in jeopardy, e.g., state funding levels, and goals whose critical intent has not yet been achieved. The latter particularly includes:

► assuring that all students, including those in high-poverty schools, have equitable access to technology;
► assuring that teachers and other educators are able to effectively integrate technology into teaching and learning; and
► assuring accountability for the use of technology.

However, there are new opportunities and challenges that must also be reflected in this State Plan. We can now see the necessity for using technology to transform the entire educational system as well as the classroom. Through e-learning and online resources, the world is open to Illinois students in a way few could have conceived only a few years ago. We can provide high-quality, diverse learning experiences for all of our students – if we choose to do so.

David Thornburg writes that, “Unless our thinking about education is transformed along with our continuing expansion of telematic technology into the classroom, our technology investment will fail to live up to its potential.” Don Tapscott, author of Growing Up Digital, concludes that unless the educational system fully embraces technology and its potential, schools will become largely irrelevant.

These observations reinforce the obligation of planners and policymakers to provide strong and strategic leadership for using technology in education. The purpose of this State Plan for Technology in P-12 Education is to ensure that the full power of current and future technologies is used to help realize our vision of education for the 21st century.
Overview of the State Plan

Vision

This Plan provides a vision for technology in education that is linked to the extraordinary challenges of the 21st century and the unique power of current and emerging technologies to help us prepare students to meet those challenges. In this vision, the educational system is responsible for ensuring that the full power of technology is used for the benefit of all students. This vision does not tolerate a system that separates children into technology “haves” and “have-nots”, and it does not settle for a definition of technology as just another learning tool. Technology is a fundamental part of our commitment to high achievement and equitable learning opportunities for all children.

Focus

This five-year Plan has been expanded to include the pre-kindergarten years, acknowledging that even our youngest children are, and will increasingly be affected by technology. Although the Plan technically covers only the elementary and secondary education system (P-12), the boundaries between that system and the higher education system have already begun to blur, and this Plan is designed to continue that process. Collaboration between the State’s educational systems through the Joint Education Committee, the Illinois Century Network policy board, and other venues will be essential to creating a continuum of technology-rich learning opportunities for Illinois citizens of all ages.

Goals and Measures

This Plan establishes a pyramid of goals for the continued growth and development of technology in P-12 education in Illinois. At the top of the pyramid is the overarching goal of using the power of technology for the benefit of all Illinois students. Two key technology goals – as support for student development of higher-order knowledge and skills and as a resource for equitable learning opportunities – reflect the unique contribution technology can make to preparing students for success in the 21st century. Seven enabling goals identify specific aspects of technology improvement that will be essential to our success in achieving the larger goals.

A preliminary set of measures is provided as a starting point for further discussion of the benchmarks that will be most appropriate for determining progress. A select advisory committee will be invited to assist in this delineation of key measures.
**Strategies**

This Plan identifies nine key strategies and 6-12 specific strategies for each of those areas. In aggregate, the strategies:

- build on our successes and reflect a renewed commitment to the effective use of technology for all students;
- require aggressive, continuous and creative attention to issues associated with the digital divide;
- call for more systemic and systematic attention to building and maintaining educator capacity to effectively use technology;
- establish a commitment to assuring the existence and quality of e-learning opportunities for Illinois students;
- give strong emphasis to accountability and actions that will ensure the quality of all aspects of technology in P-12 education; and
- highlight the need to increase minority participation in technology leadership and implementation.

These strategies are intended as a framework that will guide decisions and actions during the next five years and allow for course-corrections as they are needed. Implementation of the strategies will include a review of the State Board technology policies, identification of additional standards and benchmarks, decisions on funding practices, and development of a fully-crafted plan for eliminating the digital divide and ensuring that all students benefit from technology.
State of Illinois

Vision for Technology in P-12 Education

All students in Illinois must be prepared to be successful in a world characterized by unlimited information, global communication, increasing complexity, and incessant change. They must be prepared for both post-secondary education and career opportunities, for effective life-long learning, and for active participation in our democracy.

Current and emerging technologies and telecommunications provide unique opportunities to help Illinois students meet learning goals necessary for success in the 21st century. These technologies make it possible for Illinois students to have equal, high-quality learning opportunities regardless of where they live. Technologies make learning possible at any time and any place; support the development of advanced knowledge and skills and the ability to apply them to complex circumstances; and allow personalization of learning that can assist each student in meeting his or her individual goals and potential.

The Illinois educational system will ensure that the full power and potential of these technologies are appropriately used for the benefit of all Illinois students.
Goals for the Illinois Technology Plan

Overarching Goal

The full power of current and emerging technologies will help ensure that the Illinois educational system prepares all students to be successful in the 21st century.

Key Technology Goals

• Technology will support all Illinois students’ attainment of the higher-order knowledge and skills essential for success in the 21st century, including specific knowledge and skills related to technology use.

• Technology will provide all Illinois students with unprecedented and equitable access to rich, diverse and high-quality learning opportunities.

Enabling or Supporting Technology Goals

• Knowledgeable and technologically-proficient educators

• Technology fully integrated in instruction

• Elimination of the digital divide through equitable access to technology resources

• Sufficient funding for technology

• High-quality e-learning opportunities

• Accountability

• Efficiency and effectiveness
KEY STRATEGIES

The following key strategies have been identified as priorities for addressing the Technology Goals during the next five years.

A. Position the state’s educational system to take full advantage of current and emerging technologies for the benefit of Illinois P-12 students, educators and schools.

B. Ensure that Illinois educators have the knowledge, skills and attitudes to appropriately integrate technology in their teaching and learning.

C. Foster high-quality instruction that uses technology to support student development of the skills needed for life in the 21st century.

D. Support world-class education through high-quality electronic learning (e-learning) opportunities that serve all P-12 students in Illinois.

E. Ensure that Illinois students and educators have equitable and appropriate access to current and emerging technologies supported by school settings modernized for technology.

F. Provide funding resources that will enable all school districts to provide and maintain adequate and appropriate learning technologies.

G. Ensure effective planning and accountability for technology use in education.

H. Improve the efficiency and effectiveness of state, regional and local educational entities through expanded and creative use of technology.

I. Increase minority participation in technology leadership and implementation in P-12 education.
STRATEGIC PLAN

Specific strategies have been identified for each of the key strategies. These will serve as the basis for development of work plan(s) that will include tasks, timelines, and designation of responsibility for implementation.

A. Position the state’s educational system to take full advantage of current and emerging technologies for the benefit of Illinois P-12 students, educators and schools.

1. Assure that all ISBE policies and initiatives give appropriate and sufficient attention to the effective use of technology; create a rubric for agency and Board use in the development and decision phases.

2. Appoint a standing advisory committee to provide advice and recommendations on technology in Illinois P-12 education, including the measures for determining progress and success.

3. Establish a cadre of national technology leaders/visionaries to advise the State Board on cutting-edge applications of technology and technology issues.

4. Establish criteria and format for a comprehensive District Educational Improvement Plan that integrates technology throughout all aspects of district operations.

5. Provide information and training to teachers and administrators about effective system change.

6. Provide leadership and support for lighthouse integration of technology in Illinois education.

7. Develop understanding and support for new educational models using technology among the public, legislators, local boards and administrators, and parents; build on and integrate successful strategies such as Tech 2000, Disney Quest, and ThinkQuest.

8. Develop strong and effective partnerships to support technology integration in Illinois P-12 education.

9. Continue to support local district efforts through the Technology Center of the State Board of Education and the regional Technology Learning Centers; refine their respective missions and services consistent with this Technology Plan and the independent evaluation of the Centers.
B. Ensure that Illinois educators have the knowledge, skills and attitudes to appropriately integrate technology in their teaching and learning.

1. Assist teacher preparation institutions in developing strategies to adequately prepare teacher candidates to meet the new technology standards for certification (i.e., core technology standards for all teachers and the technology standards specific to their teaching areas).

2. Analyze the results of the tests for Initial Certification (beginning in July 2003) to determine how well teacher candidates meet the certification standards and to identify changes that may be needed in pre-service programs and/or the state certification assessment.

3. Establish standards for technology professional development for Illinois educators, including professional development that is provided online; ensure that there is appropriate focus on the engaged-learning model, e-learning, and best practices for adult learning.

4. Promote and deliver high-quality technology professional development opportunities for Illinois educators, including e-learning opportunities through IVHS and other providers.

5. Create an Internet portal for Illinois educators to connect to high-quality training and communication sites; provide information/guidance, especially for teachers, regarding available e-learning opportunities.

6. Encourage local school districts to support appropriate technology professional development of Illinois teachers through their policies and practices, including teacher evaluation systems that include the teacher’s use of technology in the classroom (commensurate with access to resources), movement on the salary schedule, technology purchase programs, etc.

7. Promote partnerships between pre-service programs and local school districts to enhance teacher preparation through technology-based strategies such as distance-observation of real-time classroom instruction.

8. Develop models for electronic portfolios and electronic mentoring for use by teacher preparation institutions, local school districts and others.
C. Foster high-quality instruction that uses technology to support student development of the skills needed for life in the 21st century.

1. Adopt essential technology skills for Illinois students and encourage local assessment of student technology proficiency.

2. Promote better understanding among educators of how technology has been integrated throughout the Illinois Learning Standards and the Applications of Learning.

3. Ensure that performance descriptors, student work, training, and resource materials for the Illinois Learning Standards reflect these technology considerations.

4. Establish on-line state assessment of student achievement and encourage local districts to use technology for their own assessments.

5. Develop and/or identify models of high-quality, technology-based instruction and assessment; use technology, model teachers and other strategies to disseminate.

6. Provide information about learning strategies using devices other than computers – e.g., PDAs, e-books, wireless and other digital devices; link to the Illinois Learning Standards.

7. Continue to provide online resources for access by local districts (e.g., Marco Polo, Schools Without Walls).

8. Ensure that technology is an integral part of all State Board of Education educational initiatives.

9. Ensure that technology is appropriately included in the ISBE “System of Support” for low-performing schools and districts.

10. Develop strategies to ensure appropriate technology use with at-risk and low-performing students.

D. Support world-class education through high-quality electronic learning (e-learning) opportunities that serve all P-12 students in Illinois.

1. Provide local school districts with information about the role e-learning can play to expand and enrich student learning opportunities in Illinois schools.

2. Adopt policies that support electronic learning (e-learning) and eliminate barriers to its implementation in Illinois.
3. Establish standards for e-learning “schools” that provide service to Illinois students, including cyber-charter schools.

4. Give priority to expansion and continuous improvement of the Illinois Virtual High School (IVHS) as a source for high-quality P-16 e-learning opportunities for all Illinois students.

5. Expand the Schools Without Walls initiative and link to IVHS.

6. Develop linkages between Illinois P-12 e-learning systems and those in other states and nations, and between P-12 e-learning systems and higher education systems in Illinois.

7. Collect and analyze information about e-learning courses being used by Illinois public schools.

E. Ensure that Illinois students and educators have equitable and appropriate access to current and emerging technologies, supported by school settings that are modernized for technology.

1. Target state funding, technical assistance and professional development on high-poverty schools.

2. Continue to support the development of the ICN; bring participating agencies together at the local level to promote cooperation and alignment of effort.

3. Assure 100% Internet connectivity for all Illinois schools and classrooms.

4. Establish standards for equitable and appropriate access to technology resources.

5. Provide on-line guidance for district awareness and acquisition of new and emerging technologies (what’s new, what’s good, what can be done with it to promote student learning).

6. Provide information and guidance for districts about the availability of technology support services; work with commercial technology support systems to assure consistency of message and adherence to regulations.

7. Ensure that local district plans for school construction or repair are aligned with technology needs and plans.

8. Promote the development of after-school and community programs that provide access to technology and technology-based learning
opportunities; consider links to the study of after-school programs required by Senate Resolution 70.

9. Promote the use of technology to meet the needs of students with disabilities, limited-English-proficiency and other special circumstances.

F. Provide funding resources that will enable schools to provide and maintain adequate and appropriate learning technologies

1. Consider funding for learning technologies as the joint responsibility of the state, school districts, business and local communities.

2. Continue dedicated state funding for P-12 technology.
   - Seek annual increases in state funding levels at least proportionate to increases in General State Aid.
   - Provide grants to districts on two-year cycle; allow expenditures over two years.
   - Establish funding priority for high-poverty districts.
   - Establish strategy for funding “lighthouse” initiatives.
   - Continue support for on-line resources.

3. Provide funding for the Illinois Virtual High School that is sufficient to allow its continuous expansion to meet the needs of Illinois schools and students.

4. Establish dedicated funding for the Illinois Century Network; transfer current ISBE funding for that initiative to the line-item.

5. Continue the Technology Revolving Loan Program.

6. Continue to aggressively seek federal funding to supplement state and local efforts.

7. Review all technology funding rules on two-year cycle to assure they are responsive to local and state priorities.

8. Encourage local district use of a comprehensive budgeting model such as “Total Cost of Ownership.”

G. Ensure effective planning and accountability for technology use in education.

1. Continue required community-based technology planning by local districts and link it to all district policies and programs through the comprehensive district improvement plan when that is implemented.

2. Encourage local district use of the "Illinois NextSteps" self-assessments as part of the planning process.

3. Establish strategies for state and local accountability re technology in Illinois P-12 education, including a strategy for data collection and reporting.

4. Conduct a continuous statewide assessment of how technology is being used to improve teaching and learning in Illinois.

5. Provide guidance and support for teachers and students regarding the safe use of Internet and other technology resources.

6. Provide guidance to educators regarding legal issues associated with technology use and e-learning (e.g., teacher and student privacy, copyrights).

H. Improve the efficiency and effectiveness of state, regional and local educational entities through expanded and creative use of technology.

1. Improve the user-quality of the ISBE website and continue to use it as the major source of on-line information about Illinois education.

2. Continue and expand ILSI and ILEARN.

3. Promote the Early Learning website and extend its availability into the community for parents without computers.

4. Establish student databases and develop a system of student identifiers.

5. Collaborate with the University of Illinois Center for Supercomputing Research to identify and develop data capabilities that address local needs and support easy access to data; develop the capacity to “mine” educational data in Illinois.

6. Make innovative use of technology the first-choice strategy for continuous improvement of the services and operation of state, regional and local education agencies.
I. Increase minority participation in technology leadership and implementation in P-12 education.

1. Ensure minority participation in leadership and advocacy for technology.

2. Increase minority participation in the policy and technical careers that impact the use of technology and telecommunication to enhance teaching and learning opportunities for all students.

3. Seek minority perspectives in developing plans to eliminate the digital divide.
PROPOSED MEASURES FOR DETERMINING PROGRESS TOWARD THE GOALS
2002-2007

The following measures for evaluating the success of this State Plan are provided as a starting point for further discussion; they will be reviewed and refined by a select committee, as identified in the strategies.

- Student performance on state and local assessments that use technology
- Percent of classrooms connected to the Internet
- Student-technology ratios in relation to accepted quality standards
- Student access to technology, differentiated by income, minority status, school size, geographic location, language and disability status outside the school
- Percentage of schools using technology to integrate local curricular offerings
- Student access to e-learning and on-line resources
- Percentage of students who use technology to access courses needed to meet the Illinois Learning Standards and college entrance requirements
- Percentage of students using technology to access advanced learning opportunities (e.g., AP, college coursework)
- Actual uses of technology in Illinois schools, as reported by teachers and principals
- Percentage of teachers who consider themselves as “beginners, intermediate, proficient, or advanced” in technology knowledge and skills (aggregate and disaggregate)
- Teacher confidence levels in using technology in their teaching and learning
- Percentage of schools with on-site specialists in technology support; ratio of support personnel to teachers
- Percentage of teachers who report they receive adequate support for integration of technology in the classroom
- Percentage of teachers who report they receive adequate support for technology operations (maintenance, problem resolution)
- Annual increase in state funding for the Technology for Success program
# APPENDIX

## Alignment of State Board of Education Goals with the Goals for the Illinois Technology Plan

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<thead>
<tr>
<th>State Board Goals</th>
<th>Technology Goals</th>
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<tbody>
<tr>
<td><strong>Student Achievement</strong></td>
<td>Technology will support all Illinois students’ attainment of the higher-order learning essential for success in the 21st century, including specific knowledge and skills related to technology use.</td>
</tr>
<tr>
<td><em>The Illinois State Board of Education will support local districts in helping all students meet the Illinois Learning Standards and in closing the achievement gap.</em></td>
<td>Technology will provide all Illinois students with unprecedented and equitable access to rich, diverse and high-quality learning opportunities.</td>
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<tr>
<td>Knowledgeable and proficient educators</td>
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<tr>
<td>Technology fully integrated in instruction</td>
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<tr>
<td>Accountability</td>
<td>Accountability</td>
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<tr>
<td>Minority participation</td>
<td>Minority participation</td>
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<tr>
<td><strong>Policies and Services</strong></td>
<td>High-quality e-learning opportunities</td>
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<tr>
<td><em>The Illinois State Board of Education will generate policies, programs, products and services that support local district efforts to ensure student success.</em></td>
<td>Efficiency and effectiveness</td>
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<tr>
<td><strong>Funding</strong></td>
<td>Sufficient funding</td>
</tr>
<tr>
<td><em>The Illinois State Board of Education will provide advocacy and leadership for adequate and equitable funding of Illinois public schools.</em></td>
<td>Equitable access to technology resources</td>
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<tr>
<td>State Board Goals</td>
<td>Technology Goals</td>
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<td>Collaboration</td>
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The Illinois State Board of Education will work with partners in all sectors of government, education, and private enterprise to support continuous improvement of Illinois education.