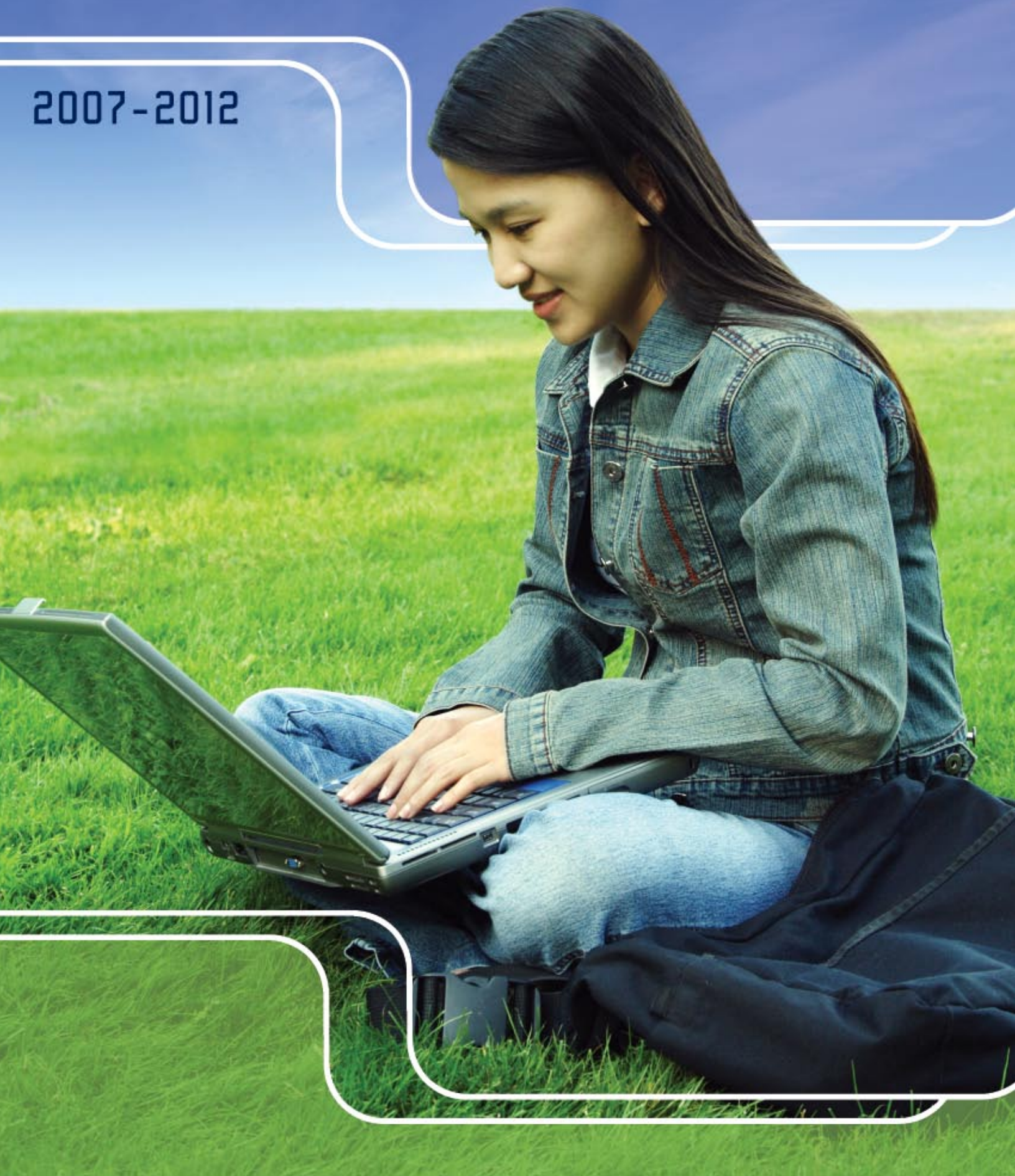
The Maryland Educational Technology Plan for the New Millennium...

2007-2012



The Maryland Educational Technology Plan for the New Millennium: Anytime, Anywhere Technology to Improve Teaching & Learning

Maryland State Board of Education

2007-2012

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Executive Summary

In 1995, the State of Maryland began implementation of the *Maryland Plan for Technology in Education*, a blueprint for effective utilization of technologies in schools statewide. The Plan, developed by the Committee on Technology in Education (COTE), representing the State's many stakeholders, served as the foundation for development and funding of educational technology programs on both the State and local levels. The committee revised the Plan in 1998 and again in 2002.

New technology and applications to support teaching and learning and improve administrative functions continue to be developed at a rapid rate. When the *Maryland Plan for Technology in Education* was first implemented, no one had heard of podcasting, blogging, text messaging, or connecting to the Internet via mobile phone. Now technology seems to change daily and our students are quick to embrace each new innovation. Most students are comfortable using technology in their daily lives and do so routinely. Schools need to keep pace and adapt to meet this change. Today's educators must recognize technology as an essential component of the instructional program, engage all students more fully in learning, and provide students with 21st Century work and life skills.

This revised five-year plan for 2007-2012 reflects the current context of the 21st Century in which technology is all around us and rapidly changing. The Plan continues to be guided by a core vision:

> *Through engaging classrooms that have current technology resources available to all students and educators as a part of their daily work, every child will reach his or her potential and achieve success. Not only will technology be available in whatever forms they take in the coming years, but rich, digital content will be available in a variety of formats. The individual learning styles and needs of every child will be addressed by using technology to differentiate instruction and provide accessible resources to all students.*

To achieve this vision, attention must be given to providing educators with high-quality professional development that includes continued time and effort to learn, maintain and improve their technology skills (Turner, 2005) and give them the ability to use those skills in their professional work. Technologically savvy teachers are more apt to use technology in their everyday classroom instruction. All educators must have their own computer and other appropriate technologies available to them if they are to be expected to infuse technology into instruction.

Likewise, all students need to have access to computing devices and rich curricula and digital resources that will enable them to attain the content knowledge and skills they need to prepare them for the future. Findings from the annual Online Technology Inventory completed by every school in the State show that technology use in our schools is not as frequent, or as effective, as it can be. Schools with the highest poverty tend to lag behind other schools in student use of technology and need to have additional resources to close the digital divide.

Administrators should be able to use technology in their daily work and provide leadership in creating a technology rich school environment. Administrative support is critical to creating a climate in which teachers continue to grow professionally in their technology knowledge and skills, and in which technology becomes a necessary, every day tool for teaching and learning.

Technology also contributes significantly to how data is used for instructional planning and student achievement. Integrated student information systems, curriculum/content management systems, and learning management systems are critical for local school systems to collect data; assess student performance; deliver curriculum and instructional resources; create collaborative work environments; and communicate information to students, staff, parents and the community. Robust systems provide administrators and teachers with critical information on every student's learning strengths and needs, allowing educators to focus strategies and resources to help each child succeed.

Because technology continues to evolve at a rapid pace, it is imperative that issues around access, infrastructure and technical support be addressed. School systems must adopt, at a minimum, a five-year refresh cycle to replace outdated equipment. Otherwise, schools will not be able to use emerging instructional software applications. Continuous upgrades need to be made to the infrastructure to address bandwidth needs as the technology becomes more and more powerful and to provide opportunities for rich applications of voice, video and data. In addition, school systems need to ensure that support staff is available to troubleshoot equipment failures and provide technical assistance to eliminate and/or minimize down time.

Finally, it is critical to continually evaluate whether or not investments in time and resources spent in integrating technology into instruction makes a difference in the classroom. Working together, the Maryland educational community and interested stakeholders can build internal capacity to understand and apply research and evaluation studies and to create a repository of effective practice.

The primary and overarching goal of the Plan has not changed – improved student learning will be achieved in all content

areas and in the technology knowledge and skills critical to students' ability to contribute and function in today's information technology society.
Five separate, but interrelated, objectives have been established to meet this overall goal:

Objective 1: Improve student learning through technology.
Objective 2: Improve staff's knowledge and skills to integrate technology into instruction.
Objective 3: Improve decision-making, productivity, and efficiency at all levels of the organization through the use of technology.
Objective 4: Improve equitable access to appropriate technologies among all stakeholders.
Objective 5: Improve the instructional uses of technology through research and evaluation.

Each objective includes progress to date, specific targets and recommended actions to achieve them, assigned responsibilities and data sources to monitor progress.
The Plan also includes a Glossary to define and clarify technological and educational terms and a List of Acronyms. In addition, there are 5 Appendices:

A. Alignment Resources (with web links to Standards and other documents)
B. Data Sources
C. Maryland Ed Tech Partnerships (with links to additional information)
D. Bibliography
E. Acknowledgements

Introduction

In 1995, when the first Maryland Educational Technology Plan was written, computers were just making their way into the classroom, many schools were not wired for the Internet, and laptops were heavy and expensive. No one had heard of podcasting, blogging, text messaging, or connecting to the Internet via mobile phones. Now, merely a decade later, technology seems to change daily and our students are quick to embrace each new innovation. Most students are comfortable using technology in their daily lives and do so routinely. Schools need to keep pace and adapt to meet this change. Today's educators must recognize technology as an essential component of the instructional program, engage all students more fully in learning, and provide students with 21st Century work and life skills.

Today's Students :
- Collaborators
- Communicators
- Critical Thinkers
- Innovators
- Multitaskers
- Problem Solvers
- Responsible Users of Technology
- Savvy Researchers

Their Technologies :
- Blogs
- Podcasts
- Text Messages
- Wikis

Maryland's educational goals and strategies for the future must reflect the current context in which technology is all around us and rapidly changing. Students expect to see and use everyday technology tools in their academic pursuits. It is critical that teachers continue to grow and refine their technology skills enabling them to make the best use of the technology tools available to them to improve teaching and learning. Resulting consequences will be students that have the technology skills they need to better learn course content, be better prepared to join the workforce and continue their own learning as adults. Administrators must support the use of technology in schools by providing appropriate resources and creating school climates that promote technological literacy. Encouraging effective, ongoing uses of technology will produce tomorrow's innovators, entrepreneurs, health care professionals, teachers, engineers, and researchers – the country's future.

Given the promises of technology for education, effective new teaching models are emerging and need to be integrated more fully into the classroom. These models, highly influenced in design by advances in technology and information systems, are contributing to gains in educational achievement. Reading and mathematics scores on the Maryland School Assessment (MSA) have improved in all 24 school systems with improved performance of students across racial categories, at all grade levels, and for most students receiving special services, according to data released by the Maryland State Department of Education (MSDE, Press Release, August 16, 2006). Improvements in Maryland and other states across the nation coincide with an explosive growth in online and multimedia instruction and "virtual schools" (National Education Technology Plan, 2004).

The National Report on NetDay's 2005 Speak Up Event, that surveyed students and teachers across the nation, identified major themes in their findings published in Our Voices, Our Future (NetDay, 2006). Student reflections indicated that they: (1) use new technologies both in and out of schools and are becoming more and more sophisticated in their technology use; (2) are motivated by their desire to use technologies for communication; and (3) believe that the use of technologies is critical to their learning experiences and preparation for competing in the workforce. Both teachers and students expressed a desire that current technology tools be available whenever they need them in school and were frustrated by barriers to access and use. Teachers also indicated that they are becoming more comfortable in using technology in their classrooms but need ongoing professional development to keep up with advances in and uses of technologies so that they can keep up with their students. In addition, because students are often more comfortable and familiar with technologies than teachers, an opportunity is created for empowering students to become leaders in the classroom resulting in teachers becoming more knowledgeable about technology and enhancing the learning process for students.

Over the past 10 years, progress continues to be made toward integrating technology-based activities into all curriculum instruction. Nevertheless, technology use still has not become part of the culture of every Maryland classroom. Data from Maryland's most recent technology inventory, reported in *Where Do We Stand in 2006?*, the tenth in a series of annual reports by the Maryland Business Roundtable for Education, indicate that many students still do not have routine access to technology, especially those living in poverty. Without changes in curricula, high-quality teacher professional development and everyday access to technologies by students and educators, the most complex and powerful uses of technol-

ogy will not be integrated on a regular basis. The *Maryland Educational Technology Plan* seeks to ensure that all students and teachers are prepared to use a variety of technologies in the classroom and have access to appropriate technology resources.

Attention must be given to educator high-quality professional development that includes continued time and effort to learn, maintain and improve their technology skills (Turner, 2005) and the ability to use those skills in their professional work. A finding from CDW-G's *Teachers Talk Tech 2006; Fulfilling Technology's Promise of Improved Student Performance*, their fourth annual in-depth research study conducted by QED, found that there is a strong connection between the amount of technology professional development that teachers receive and their perception of value, understanding and use of instructional technology in the classroom. Additionally, learning communities, where teachers communicate with each other through technologies like learning management systems and blogs to share their newly learned technology skills and to collaborate on curriculum or professional development, have become commonplace. Cavanaugh and Cavanaugh (2005) note that allowing for reflection and feedback creates a sense of community and offers an avenue for sustaining momentum for action research within and outside of the local school district. To help educators understand their areas of expertise and to plan professional development for additional growth, Maryland has developed a set of tools: The *Maryland Teacher Technology Standards*, the *Maryland Teacher Professional Development Standards Planning Guide*, and the *Online Technology Profile for Teachers*.

> "It is imperative that principals possess technology skills and see technology literacy for students and staff as a priority. Our students face a very competitive environment in today's global society and technology literacy is central to their future success."
>
> Nancy S. Grasmick, Maryland State Superintendent of Schools

Likewise, all students need to have access to rich curricula and digital resources that will enable them to attain the content knowledge and skills they need to prepare them for the future. Findings from the most recent technology inventory, *Where Do We Stand in 2006?*, indicate that technology in our schools is not being used as frequently, or as effectively, as it can be. This is particularly true in the more complex uses of technology that experts suggest should exercise higher-order critical thinking skills that will improve student problem solving skills. Schools with the highest poverty seem to lag behind other schools in student use of technology, which is a challenge in trying to bridge the digital divide. To this end, the State has developed *Maryland Technology Literacy Standards for Students* to assist every student in becoming technologically literate and building the 21st century skills needed to succeed in this information driven society.

Administrators must also be able to use technology in their daily work and provide leadership in creating a technology rich school environment. Administrative support is critical to fostering a school and school system culture in which teachers continue to grow professionally and in which technology becomes a necessary, every day tool for teaching and learning.

To help administrators increase their own technology literacy, Maryland has developed The Maryland Instructional Leadership Framework, the Maryland Technology Standards for Administrators, and the Online Technology Toolkit for Administrators. These resources assist administrators in understanding the importance of technology infusion, and in increasing their own knowledge and skills to improve efficiency and productivity.

Technology can also improve how data is used for instructional planning and student achievement. Integrated student information systems, curriculum/content management systems, and learning management systems are used by local school systems to collect data, assess student performance, deliver curriculum and instructional resources, and to create collaborative work environments. Robust systems provide administrators and teachers with critical information on every student's learning strengths and needs, allowing educators to focus strategies and resources to help each child succeed.

Because technology continues to evolve at a rapid pace, it is imperative that issues around access to technology, infrastructure and support be addressed. Technology becomes dated quickly; therefore, school systems must adopt a refresh cycle to replace outdated equipment. Otherwise, schools will not be able to use emerging instructional software applications. Continuous upgrades need to be made to the infrastructure to address bandwidth needs as the technology becomes more and more powerful. In addition, school systems need to ensure that support staff is available to troubleshoot equipment failures and provide technical assistance to eliminate and/or minimize down time.

Finally, it is critical to continually evaluate whether or not investments in time and resources spent in integrating technology into instruction makes a difference in the classroom. Research from The International Society for Technology in Education's (ISTE) Center for Applied Research in Educational Technology (CARET) indicates that integrating technology into teaching and learning has a positive effect on student achievement. (Cradler and Cradler 2003). These studies demonstrate a need for further analysis of the effects of technology use on student learning, creative thinking, and communication. Partnerships of state and local school systems, higher education, profit and nonprofit organizations need to engage in meaningful research and evaluation to ensure that the programs and practices implemented are effective. Working to-

gether, the Maryland educational community and interested stakeholders can build internal capacity to understand and apply research and evaluation studies and to create a repository of effective practice.

Charting MSDE's education technology direction for the new millennium means moving it toward the *New Golden Age in American Education* described in the National Education Technology Plan. To that end, the Maryland Educational Technology Plan incorporates the seven action steps of the National Education Technology Plan:

1. Strengthen Leadership
2. Consider Innovative Budgeting
3. Improve Teacher Training
4. Support E-Learning and Virtual Schools
5. Encourage Broadband Access
6. Move toward Digital Content
7. Integrate Data Systems

The educational technology outlined in Maryland's revised technology plan supports each of these tenets and goes beyond that to serve Maryland's educational community and all its learners.

The development of *The Maryland Educational Technology Plan for the New Millennium* offers an opportunity for greater use of technology to impact teaching and learning. Many stakeholders were involved in the examination, discussion and determination of the objectives that would be important to implement for the effective infusion of educational technology into Maryland classrooms, curricula, and instruction. Through this decision making process, stakeholders identified the objectives, targets and strategies that would achieve the overarching goal of the technology plan – improved student learning.

Vision

Through engaging classrooms that have current technology resources available to all students and educators as a part of their daily work, every child will reach his or her potential and achieve success. Not only will technology be available in whatever forms they take in the coming years, but rich, digital content will be available in a variety of formats. The individual learning styles and needs of every child will be addressed by using technology to differentiate instruction and provide accessible resources to all students. Online learning will continue to expand, removing traditional walls and providing schools with an opportunity to meet a variety of student needs both on-campus and off. Schools will no longer rely on traditional textbooks as the main centerpiece of instruction, but rather use an array of quality, current digital resources. Teachers will collaborate across time and space in the refinement and development of learning resources. Students will facilitate their own learning, guided by teachers knowledgeable in content, pedagogy and technology infusion, using real time, real world resources to solve problems and to address rigorous curricula. They will be able to research compelling topics and continue to learn new information. With increased access to resources comes a responsibility to understand and practice ethical and safe use of information. Students will understand digital citizenship and apply smart practice related to copyright, plagiarism, social networking and appropriate use of information. As students have access to technology resources in all subjects, not only will they better learn course content, but they will also develop, as demonstrated by mastery of the *Maryland Technology Literacy Standards for Students* (MTLSS), critical technology and information literacy skills necessary for life in this new millennium, allowing them to compete and excel in an increasingly global, competitive world.

Charting the Future

Federal Reform Movement

On January 8, 2002, President Bush signed into law the *No Child Left Behind Act* (NCLB), landmark legislation that dramatically altered school reform. NCLB combined several acts into one piece of sweeping legislation with accountability at its core. The law required that states develop standards and measure student progress toward them, publish report cards to show progress in student performance, provide highly qualified teachers, and intervene when schools are unsafe or students are not making adequate progress.

No Child Left Behind highlights these critical tenets for states:

- Improve Student Achievement;
- Ensure Highly Qualified Teachers;
- Use Data to Increase Accountability; and
- Provide Access to Close the Achievement Gap.

Maryland's Reform Movement

In 2002, the Maryland General Assembly passed the *Bridge to Excellence in Public Schools Act*, based on the recommendations of the Thornton Commission, a state panel that studied school finance. The Act resulted in increased funding for public schools and gave school systems greater flexibility in how they spent their funds to improve student achievement.

In January of 2002, the Visionary Panel for Better Schools, a task force appointed by State Schools Superintendent Nancy S. Grasmick, issued a much-anticipated final report. The Visionary Panel's charge was to examine Maryland's existing school reform efforts and to make recommendations for improvement that would lead to a new reform plan for the next decade in Maryland.

The State legislation, combined with both the Visionary Panel report and the *No Child Left Behind* legislation, became the foundation of Maryland's new reform plan, aptly titled *Achievement Matters Most*. The new plan sets goals in the areas of student achievement, teaching and learning, testing and accountability, safety, and family involvement in schools. *Achievement Matters Most* is the blueprint for educational excellence in Maryland.

As a result of the legislation and reports described above, local school systems were required to submit a five-year, comprehensive Master Plan to the Maryland State Department of Education (MSDE) in August of 2003. Through this plan, each school system was required to define the goals, objectives, and strategies it would institute to improve student achievement and to meet state and local performance standards for each subgroup of students using all sources of funding. A Guidance Document was developed by the Maryland State Department of Education to assist local school systems in preparing their Master Plans.

Local School System Master Plans must include goals, objectives, and strategies for addressing how technology will be integrated into curriculum, instruction, and high- quality professional development, as well as addressing all other aspects of educational technology.

Every school system is required to submit an annual update of its Master Plan, creating opportunities for continuous improvement. Through this process, Local Education Agencies (LEAs) can ensure that their Master Plan and current technology plan are aligned with the State Technology Plan.

Maryland Educational Technology Partnerships

- Algebra/Data Analysis Collaborative
- Cognitive Tutor: Algebra I
- Curriculum Management Systems
- Generation Yes
- Learning Management Systems
- Maryland Students Online Consortium (student online learning)
- MDK-12 Digital Library
- Project OPEN (online professional development)
- Shore Readers
- Teacher and Administrator Technology Profile
- Technology Literacy by 8th Grade (TL8)

Partnerships for Educational Technology

Beginning in 2002-2003, the Maryland State Department of Education formed partnerships with Local School Systems through the federal *Enhancing Education through Technology* (Ed Tech) Program to meet the objectives of the Maryland Technology Plan. (See Appendix C for a description of the partnerships). Through collaboration, the Maryland educational community worked strategically toward implementing goals of the State technology plan to address the mutual needs of all school systems.

All 24 local school systems in Maryland participated in the MDK-12 Digital Library and in the Technology Literacy by 8th Grade partnerships. The MDK-12 Digital Library project has resulted in a collective purchasing consortium consisting of all 24 school systems that is now collaborating with the public library community to provide online databases for all schools. Through the Technology Literacy by 8th Grade partnership, the *Maryland Technology Literacy Standards for Students* have been developed and piloted in school systems. Data collected from all of the projects will help local school systems make informed decisions related to educational technology and help Maryland create systemic change in addressing a variety of issues identified in the Maryland Technology Plan. In addition, collaborative communities around the state have been developed, resulting in local school systems networking and sharing ideas with each other at a rate never before experienced in Maryland.

As the federal legislation was being moved forward in Washington, DC, the Maryland legislature passed a bill that required the Maryland State Department of Education to take a lead in online learning for the State. As a result, the Maryland Virtual Learning Opportunities Program was created. Several of the Ed Tech partnership grants have helped increase virtual learning opportunities in Maryland. A variety of student courses are now offered through this program and the State Department of Education, in collaboration with local school systems, has developed standards for evaluating and implementing online student courses that school systems can use as a guide. Student participation in online courses has increased from 31 in FY 2003 to 934 in FY 2007 and continues to grow. The State is also turning its attention to online courses for teacher professional development. Courses for teacher professional development have increased from 5 in FY 2003 to 57 in FY 2007.

Maryland State Department of Education Strategic Plan

As Maryland prepares the next generation of citizens, the Maryland State Department of Education, local school systems, institutions of higher education, businesses, and the larger community of citizens need to work together to make certain that educators have the technology tools, skills and strategies to respond to student needs and reflect the world in which we live. The *Maryland State Department of Education Strategic Plan* has as its goals:

Goal 1: Achievement will improve for each student.
Goal 2: Instruction, curriculum, and assessment will be better aligned and understandable.
Goal 3: All educators will have the skills to improve student achievement.
Goal 4: All schools will be safe, drug-free, and conducive to learning.
Goal 5: Families will be involved in education.

The Maryland Educational Technology Plan is a blueprint for helping to accomplish these goals, as well as those of *No Child Left Behind* and the *National Education Technology Plan*, through intelligent planning and innovative applications of technology in Maryland schools.

The Plan

Goal:

Improved student learning will be achieved in all content areas and in the technology knowledge and skills critical to students' ability to contribute and function in today's information technology society.

STUDENT LEARNING

Objective 1: Improve student learning through technology.

PROFESSIONAL DEVELOPMENT

Objective 2: Improve staff's knowledge and skills to integrate technology into instruction.

ADMINISTRATIVE PRODUCTIVITY AND EFFICIENCY

Objective 3: Improve decision-making, productivity, and efficiency at all levels of the organization through the use of technology.

UNIVERSAL ACCESS

Objective 4: Improve equitable access to appropriate technologies among all stakeholders.

RESEARCH AND EVALUATION

Objective 5: Improve the instructional uses of technology through research and evaluation.

Objective 1: Improve student learning through technology

"Our students will be inhibited in their future opportunities unless they possess a level of competency in current areas of technology as well as the capability to utilize evolving technology."

Dr. Nancy S. Grasmick, Maryland State Superintendent of Schools

"Technology ought to be thought of as a road to hope."

Rudy Crew, Superintendent of Miami-Dade County Public Schools, in a keynote speech at the Florida Educational Technology Conference in Orlando, March 22-24, 2006.

Targets:

- Digital content will be available.
- Digital content will be integrated into all instruction as appropriate.
- Students and staff will have expanded access to curricula and support related to Maryland standards.
- All students will have access to instructional resources that incorporate universal design.
- MSDE's website will provide coordinated access to information and resources.
- Students, staff, and Adult Education Programs will use digital resources after school hours.
- All students will demonstrate mastery of technology literacy by the end of eighth grade.

Progress to Date:

- The Voluntary State Curriculum includes technology-related indicators for student learning and critical skills necessary for student success.
- Student enrollments in online courses provided through MVLO have increased from 31 in FY03 to over 1234 in FY07, with registrations continuing.
- Student enrollments in the online AP course increased from 103 students in fall 2005 to 178 in FY07.

- The number of online courses available to students has increased from 5 in FY 2003 to 57 in FY 2007.
- MSDE facilitated student enrollments in the High School Assessment courses – Algebra/Data Analysis and Government – for 400 students in fall 2005 and 3,090 in fall of 2006/winter of 2007, with daily requests continuing.
- All students and educators have been provided access to curriculum resources and to statewide online digital content through the MDK-12 Digital Library federal grant partnership.
- School districts have saved nearly a quarter million dollars statewide on databases from five vendors over the 2004/2005 and 2005/2006 school years as a result of the MDK-12 Digital Library project.
- All public school students in the state have equal access to a suite of eleven online databases.
- Five school districts can now afford district-wide purchases of databases as a result of the MDK-12 Digital Library federal grant partnership.
- 102 nonpublic schools participate in the MDK-12 Digital Library Project.
- Science Resource Center has been provided for all Maryland teachers and students through collaboration with public libraries.
- The *Maryland Technology Literacy Standards* for Students have been developed (through a partnership consisting of all 24 local school systems and MSDE staff) and accepted by the Maryland State Board of Education in February 2007 to address the NCLB requirement that all students be technologically literate by the end of eighth grade. Resources to accompany the standards are also available for teachers.
- A School Library Media Voluntary State Curriculum has been developed and aligns to the Maryland Student Technology Standards.
- Learning management systems are being used by educators and students to enhance traditional face-to-face classroom instruction and to provide curricula and rich digital content.

Objective 1: Improve student learning through technology

Targets for 2012	Recommended Actions	Data Sources
1.1 Digital content will be available before, during and after school to support teaching and learning.	Offer students and educators cost-effective access to online courses and other digital content through collaborative development and purchasing agreements. (State, Local) Incorporate digital content into instruction to decrease the dependency on print materials. (State, Local) Develop policies and procedures and seek funding opportunities to provide digital resources to educators, students, parents, and communities before and after school hours. (State, Local) Collaborate with public libraries to provide anytime, anywhere access. (State, Local)	Maryland Technology Inventory (annually) School Library Media Annual Report MSDE Learning Object and Content Repository
1.2 Digital content will be integrated into all instruction, as appropriate, to support teaching and learning.	Establish a process, rubric, and criteria for developing electronic toolkits that provide lesson seeds and other instructional resources that incorporate technology and information literacy, and that are aligned to the Maryland Voluntary State Curriculum (VSC). (State, Local) Identify and promote instructional delivery models that use current and emerging technologies to support student learning. (State, Local)	Teacher observations and evaluations Local curricular documents that demonstrate integration of information literacy and technology Student work Unit lesson plans

Targets for 2012	Recommended Actions	Data Sources
1.3 Students and staff will have expanded access to curricula and support related to Maryland standards through online courses, content, collaboration, and support.	Explore partnerships with existing digital libraries such as Maryland Public Library Electronic Resource Consortium (MPLERC), Maryland Digital Library (MDL), and MDK12 Digital Library Consortium. (State, Local) Develop a learning object and content repository to facilitate resource sharing. (State, Local, National) Provide technical assistance and support for Local School Systems to ensure that online courses and other digital content are available for students and are also extended to Adult Education Programs as appropriate. (State, Local) Provide access for students and staff to a Learning Management system (LMS) and appropriate training to expand available curricular resources, support differentiated instruction and promote e-learning communities. (State, Local).	Number of Maryland State approved online courses Number of Maryland students enrolled in online courses (beginning 2002) Online databases available in each county as reported in the annual School Library Media Report Usage statistics from online databases available to students and staff. Information about access to and use of Learning Management Systems and Learning Object and Content Repositories (Maryland Technology Inventory) Student and educator usage statistics for High School Assessment (HSA) online courses and curricular resources
1.4 All students will have access to instructional resources that incorporate universal design.	Collaborate with Local School Systems to identify and publish "effective practices" in implementing digital content that accommodate diverse learning needs of all students. (State, Local) Provide assistive technology to students whose Individual Education Programs and 504 plans recommend or require these devices. (Local)	All Maryland State Department of Education websites and online resources Local School System Policies and Procedures Local School System Websites Master Plans and Updates
1.5 MSDE's website will provide coordinated access to information and resources through collaboration with and linkages to other portal providers.	Establish a Steering Committee of stakeholders to guide the resource development of and policies for a State Education Website. (State, Local) Develop a Website that is organized, searchable and user friendly, according to Steering Committee recommendations. (State) Monitor effectiveness of the Website. (State, Local)	Content provided on the MSDE Website The number of visits to the MSDE Website and user feedback

Targets for 2012	Recommended Actions	Data Sources
1.6 All students will demonstrate mastery of technology literacy by the end of eighth grade as specified in the: • Maryland Student Technology Literacy Standards; • School Library Media Voluntary State Curriculum; • Technology Education Voluntary State Curriculum.	Ensure that Local School System technology plans include strategies that incorporate the *Maryland Technology Literacy Standards for Students* into Local School System curricula and instructional programs. (State, Local) Determine a statewide process to collect quality, consistent data in measuring the progress of students in mastering the *Maryland Technology Literacy Standards for Students* to meet federal reporting requirements. (State, Local) • Develop process and pilot in FY08 • Implement and report in FY09 • Report to MSDE yearly on progress toward meeting the goal • Consider how best to integrate the reporting into the Master Plan process Increase opportunities for library media specialists to collaborate with classroom teachers, other educators, and public libraries to provide authentic learning experiences that develop proficiency in information literacy, communication, and technology literacy skills. (State, Local) Ensure that all local school systems deliver a Technology Education program that aligns to the VSC. (State, Local) Develop and publish model lesson plans and assessment items to measure technology-related knowledge and skills. (State, Local)	TL8 Student Toolkit School Library Media Information Literacy Toolkit Local measurements

Objective 2: Improve staff's knowledge and skills to integrate technology into instruction

"Teachers must engage in high-quality, on-going professional development and training to understand how to fully and effectively utilize technology in the classroom to ensure that the benefits of technology use translate down to the kids."

Bob Marshall, CEO and President, AWS Convergence Technologies, Inc.

"Effective professional growth and development that enables educators to use technology well is not trivial, but it is absolutely critical to success."

Don Knezek, CEO, International Society for Technology in Education (ISTE)

Targets:

- All teachers and library media specialists will meet State-established standards.
- All administrators at the school and district levels will meet State-established standards.
- All Maryland teacher candidates will meet state-established standards.
- One instructional technology support person will be available for every 100 instructional and administrative staff members.

Progress to Date:

- All teacher candidates from Maryland approved teacher education programs are required to demonstrate proficiency in the Maryland Teacher Technology Standards.
- Diagnostic tools developed by the Online Technology Profile for Teachers and Administrators partnership that measure a teacher's technological proficiency and ability to integrate technology into instruction are available to local school systems.
- MSDE adopted the Maryland Instructional Leadership Framework which includes a technology component. This framework forms the basis for all training of principals, assistant principals and potential leaders in the Maryland Leadership Development Program.
- MSDE is in the process of redesigning the Leadership Learning Series I: Data-Driven Decision Making to help administrators make effective instructional decisions in order to improve student achievement.
- *Maryland Technology Standards for School Administrators* have been developed and are being used in many school systems to drive professional development for administrators in the use of technology.
- Educators have expanded access to professional development opportunities through hybrid and online courses and e-communities.
- Professional development has been provided to teachers and library media specialists on how to use online digital resources through the MDK-12 Digital Library federal grant partnership.
- MSDE is providing professional development in using the online High School Assessment courses and resources and supporting school systems in providing their own professional development, as well as responding to individual teacher questions as they arise.
- Professional development to assist teachers in teaching online high school or professional development courses or to support students taking online courses increased from 52 teachers in FY 05 | to 182 teachers in the first semester of 2006-2007.
- Professional development on HSA courses was provided to more than 336 teachers and central office staff in the summer and fall of 2005 and to 678 in the summer and first semester of 2006-2007.
- Professional development on the HSA courses for online Algebra/Data Analysis and Government has been integrated into the summer Governor's Academies.

Objective 2: Improve staff's knowledge and skills to integrate technology into instruction

Targets for 2012	Recommended Actions	Data Sources
2.1 All teachers and library media specialists will meet State-established standards for technology-related knowledge and skills.	Incorporate technology requirements into local professional development plans. (State, Local) Integrate the Maryland Teacher Technology Standards (MTTS) and Maryland Technology Literacy Standards for Students (MTLSS) into all professional development programs, including courses for recertification and continuing professional development, at the State, local, and school level. (State, Local, Higher Education) Encourage local school systems to use the Maryland Online Profile Tool to: measure teacher technology literacy; assist staff in structuring their individual professional development plans for meeting the Standards; and shape professional development opportunities at the system and school levels. Extend these resources to Adult Education Programs as appropriate. (Local) Share models of successful professional development that address the Maryland Teacher Technology Standards through strategic partnerships and the Professional Development Coordinators Network. (State, Local) Seek funding and other strategic partnerships to provide opportunities for state and local professional development programs that include rich technology applications. (State, Local) Develop high-quality professional development hybrid and online courses and e-communities to provide anytime, anywhere course opportunities and support for technology infusion. (State, Local) Determine a statewide process to collect quality, consistent data in measuring the progress of teachers in mastering the *Maryland Teacher Technology Standards* to meet federal reporting requirements. (State, Local, Institutions of Higher Education) • Develop process and pilot in FY08 • Implement and report in FY09 • Report to MSDE yearly on progress toward meeting the goal • Consider how best to integrate the reporting into the Master Plan process Consider ways to reward teachers that have achieved proficiency on meeting the standards. (State, Local) Build internal capacity in schools to support technology-related professional development using district and school administrators, county or school-based technology infusion specialists, school library media specialists, teachers, and other knowledgeable partners. (State, Local)	Online Technology Inventory of each school (annually) Local School System measurements, using instruments such as the *Maryland Online Teacher Profile Tool* Local School System Professional Development Plans Local School System Technology Plans

Targets for 2012	Recommended Actions	Data Sources
	Develop evaluation criteria and standards-based tools that can be used by school and central office administrators in observations to evaluate an instructional staff member's competency related to the Standards. (State, Local) Explore the possibility of a technology requirement for recertification for teachers. (State, Local) Explore the possibility of an endorsement for the position of Technology Infusion Specialist who assists teachers and administrator in implementing the administrator, teacher and student technology standards. (State, Local, Institutions of Higher Education) Provide incentives to encourage technologically literate teachers to teach or continue to teach in low-performing schools as well as rural and urban areas. (State, Local, MBRT)	
2.2 All administrators at the school and district levels will meet State-established standards for technology-related knowledge and skills.	Align the Maryland Technology Standards for School Administrators with the Maryland Instructional Leadership Framework and include the Standards as part of the Framework implementation. (State, Local) Adopt and implement the *Maryland Technology Standards for School Administrators*. (State, Local) Develop high-quality professional development hybrid and online courses to provide anytime, anywhere course opportunities for administrators. (State, Local) Use the online technology toolkit for administrators to assess the knowledge and skills of administrators and assist them in creating professional development plans for meeting the Standards. (Local) Explore the possibility of a technology requirement for recertification for school administrators. (State, Local) Provide professional development opportunities for administrators and administrator candidates to understand the *Maryland Teacher Technology Standards* and the *Maryland Technology Literacy Standards for Students*. (State, Local) Develop evaluation criteria and standards-based tools that can be used by central office staff in observations to evaluate administrators' competency related to the Standards. (State, Local)	Online Technology Inventory of each school (annually) Local School System measurements, using instruments such as the *Maryland Online Teacher Profile Tool* Local School System Professional Development Plans Local School System Technology Plans

Targets for 2012	Recommended Actions	Data Sources
	Determine a statewide process to collect quality, consistent data in measuring the progress of administrators in mastering the *Maryland Technology Standards for School Administrators* to meet federal reporting requirements. (State, Local, Institutions of Higher Education) • Develop process and pilot in FY08 • Implement and report in FY09 • Report to MSDE yearly on progress toward meeting the goal • Consider how best to integrate the reporting into the Master Plan process	
2.3 All Maryland teacher candidates will meet state-established standards for technology-related knowledge and skills.	Continue to require Maryland teacher education programs to address the Maryland Teacher Technology Standards for approval and monitor effectiveness. (State, Higher Education)	Maryland Teacher Education Program Approval Process (Five-Seven Year Cycle)
2.4 One instructional technology infusion specialist will be available for every 100 instructional and administrative staff members to assist with professional development and curriculum integration.	Explore funding models to move toward meeting the instructional technology support target. (State, Local) Develop a job description for technology infusion specialist. (State, Local) Evaluate the effectiveness of instructional technology support. (State, Local) Share models of effective implementation. (State, Local)	Online Technology Inventory of each school (annually)

Objective 3: Improve decision-making, productivity, and efficiency at all levels of the organization through the use of technology

"Technology is a critical tool that must be used to support teachers in the classroom, enhance student learning and improve accountability. School systems need to mirror the innovative technology advances used everyday in private industry to make real-time information instantly available to support learning in the classroom."

Dr. Jerry D. Weast, Superintendent, Montgomery County Public Schools

"Implementing a successful district-wide data-driven decision-making process requires the buy-in of all stakeholders, including district leaders, teachers, principals and site-based support staff."

Keith R. Krueger, CEO, Consortium for School Networking (CoSN)

Targets:

- All staff will use electronic information and communication tools to improve management and operational efficiency.
- Schools and school systems will provide leadership and support in access to and use of technologies for administrative and operational purposes.
- School systems will develop processes and strategies to provide access to digital resources, data, and information after school hours.
- School systems will develop processes and strategies to provide electronic communication with educators, students, parents, and the community.
- School systems will develop and implement data management systems, integrated student information systems, curriculum/content management systems, and learning management systems.
- Student, school, and district data provided by the State will be available to local school systems for analysis and decision-making.

Progress to Date:

- The MSDE Website provides local school systems with the assistance they need to analyze and correctly interpret the results of state assessments of students' progress.
- The MSDE Website provides customized reports and information to stakeholders at the state, local school system, and school levels.
- Local school system Chief Information Officers (CIO) are meeting regularly and are addressing issues such as establishing regular communication with instructional staff, Total Cost of Ownership (TCO), Return on Investment (ROI) and Value of Investment (VOI).

Objective 3: Improve decision-making, productivity, and efficiency at all levels of the organization through the use of technology

Targets for 2012	Recommended Actions	Data Sources
3.1 All staff will use electronic information and communication tools to improve management and operational efficiency.	Revise local policies and procedures to include expectations for job-related technology knowledge and skills for all staff. (State, Local) Work toward revising job descriptions and evaluation criteria to reflect technology requirements in local policies and procedures. (State, Local) Provide high-quality professional development opportunities for MSDE and local school system staff to acquire and expand job-specific technology-related skills. (State, Local)	Administrator observation Performance evaluations Monitoring management and operational efficiency
3.2 Schools and school systems will provide leadership and support in access to and use of technologies for administrative and operational purposes.	Conduct an internal review of current practices to determine how technology can improve efficiency and communication. (State, Local) Ensure that planning documents include strategies for providing leadership and supporting staff as they access and use technologies for administrative and operational purposes. (Local) Develop a process to review school improvement plans and strategies for using technology to support school improvement goals. (Local)	School Improvement Plans Master Plans and Updates Local School System Professional Development Plans Local School System Technology Plans
3.3 School systems will develop processes and strategies to provide access to digital resources, data, and information before and after school hours.	Research, acquire, and maintain systems that will provide anytime, anywhere access to resources, data, and information with appropriate access rights and systems to provide electronic communication. (State, Local)	Online Technology Inventory of each school (annually) Local School System Technology Plans
3.4 School systems will develop processes and strategies to provide electronic communication with educators, students, parents, and the community.	Collect and publish local school system strategies for effective communication between the school and home/community. (State, Local) Partner with public libraries to offer communities greater access to electronic communication and computer equipment. (State, Local)	Online Technology Inventory of each school (annually) Local School System Technology Plans
3.5 School systems will develop and implement data management systems, integrated student information systems, curriculum/content management systems, and learning management systems.	Ensure that MSDE and local needs assessment policies, procedures, and evaluation criteria include expectations for the use of student information systems, curriculum/content management systems, and learning management systems to inform local program and instructional decisions. (Local) Work toward implementing State developed information systems such as the online Individual Education Program (IEP) and the Educators Information System (EIS) for certification. (State, Local)	MSDE Strategic Plan School Improvement Plans Local Policy and Procedure documents Evaluation reports on completed professional development

Targets for 2012	Recommended Actions	Data Sources
	Use student, school, and district data for analysis and decision-making. (State, Local) Provide high-quality professional development opportunities for staff, as appropriate, to effectively use the information management systems to monitor student performance, to analyze student data, and to use the results to inform instructional decisions. (State, Local) Develop, document and share effective practices and protocols in security design and management to ensure the confidentiality, privacy, and integrity of student and staff data, as well as protect school system data. (State, Local)	Online Technology Inventory of each school (annually) Local School System Technology Plans
3.6 Student, school, and district data provided by the State will be available to local school systems for analysis and decision-making.	Establish a process to review all current requests for data with the purpose of reducing redundancy. (State, Local) Allow for digital signatures by auditors on all data reports and forms. (State) Provide professional development on state data collection tools and systems. (State, Local)	Specifications on available systems Usage statistics on Databases Copies of Sample Professional Development Plans Local School System Professional Development Plans

Objective 4: Improve equitable access to appropriate technologies among all stakeholders

"It is imperative that our students be provided with 21st century technology to learn 21st century skills! One- to-One Laptop Initiatives across the country are changing the lives of our students and leveling the playing field so that ALL students will be able to sit at the table of 21st century economic success."

Dr. Karen B. Salmon, Superintendent of Schools

Targets:

- All schools will provide:
  - One high performance computer per educator.
  - One high performance computer or computing device per student at the secondary level.
  - A 3:1 student to computer ratio at the elementary level.
  - Access to a variety of other technology devices.
  - One computer projection device/display unit per instructional area.
  - Connection to a broadband speed LAN/WAN.
  - A secure computing environment to ensure safe access.
- All school systems will have policies and procedures in place to address accessibility of resources and to meet the needs of all students.
- School systems will provide access to technology before and after school hours.
- School systems will provide:
  - Technical support using a locally established response system.
  - At least one full-time technical support person for every 300 computers.
  - At least one full-time LAN administrator per 40 servers.
  - At least one full-time WAN administrator per 25 sites.

Progress to Date:

- An independent evaluator (MTG) commended The Maryland State Department of Education for conducting comprehensive inventories of education technology usage in Maryland schools for the past 10 years.
- The Maryland State Department of Education was commended for its 10-year effort that resulted in bringing the student computer ratio in classrooms down from 16:1 to 4:1. This outcome surpassed the goal of a 5:1 ratio by 2005.
- All school systems have developed policies and procedures to address Education Article § 7-910: Equivalent Access for Students with Disabilities and COMAR 13A.05.02.13H (Accessibility of Technology-Based Instructional Products).

Objective 4: Improve equitable access to appropriate technologies among all stakeholders

Targets for 2012	Recommended Actions	Data Sources
4.1 All schools will provide: • One high performance computer per educator for administrative and instructional use; • One high performance computer or computing device per student at the secondary level and a 3:1 student-to-computer ratio at the elementary school level to provide on-demand, equitable access to a variety of technological tools; • Access to a variety of other technology devices to maximize student learning; • One computer projection device or display unit per classroom and other instructional areas; • Connection to a broadband speed LAN/WAN from every instructional and administrative area, including all re-locatable classrooms, to support the use of high-quality digital learning resources; and • A secure computing environment to ensure safe access and information integrity.	Address strategies for procurement, refreshment, maintenance, adequate technical support, and upgrading of hardware and software in Local School System Technology Plans. (State) Define "high performance" in the Online Technology Inventory. Develop and share innovative strategies for acquiring financial resources for cost savings and increased efficiency in procuring and maintaining technologies. (State, Local). Review and revise school construction and telecommunications standards to update them and prepare infrastructures for a one-to-one learning environment; develop guidelines for recommending funding investments for infrastructure. Explore strategies, such as Total Cost of Ownership (TCO) and Return on Investment (ROI), Value of Investment (VOI) that assist with cost savings for technology planning. (State, Local) Publish effective practices that use new and emerging technologies and devices to extend the flexibility, accessibility, usefulness, and cost-effectiveness of infrastructure. (State, Local) Develop guidelines for installing equipment and configuring networks for maximum efficiency and effectiveness. (Local) Assess long-term connectivity and bandwidth needs and develop strategies for meeting them. (Local) Review and revise local school system Acceptable Use and Internet Safety policies to reflect the current online environment. (State, Local) Monitor Local School System compliance with the federal Children's Internet Protection Act (CIPA) to be eligible for federal funds. (State) Explore partnerships with Internet providers such as Sailor, MD Online Network, and University of Maryland Academic Telecommunication System (UMATS). Explore the potential of connecting WANs to Internet 2.	Online Technology Inventory of each school (annually) Local school system data Local School System Technology Plan Local School System Policies and Procedures

Targets for 2012	Recommended Actions	Data Sources
4.2 All school systems will have policies and procedures in place to address equivalent accessibility to technology-based products for students, as defined by Education Article §7-910 of the Public Schools - Technology for Education Act.	Monitor local school system compliance with Education Article §7-910 of the Public Schools - Technology for Education Act. (State) Report annually to the Maryland General Assembly on the status of Local School System compliance with Education Article §7-910 of the Public Schools - Technology for Education Act. (State)	Online Technology Inventory of each school (annually) Special Education compliance reports Annual Status Report to Legislature Master Plans and Updates
4.3 School systems will provide access to technology after school hours for all learners.	Develop plans, including policies and procedures, for after school access to computers and other technologies and resources, especially in areas where technology is not available in homes. (Local) Seek funding opportunities or creative strategies to provide incentives that encourage after school access to technology and resources especially in areas where technology is not available in homes. (State, Local, MBRT) Collaborate with public libraries, community centers and institutions of higher education to provide anytime, anywhere access to technologies and digital content. (State, Local)	Online Technology Inventory of each school (annually)
4.4 Local School Systems will provide: • Technical support using a locally established response system, including an adequately staffed, efficient help desk; • At least one full-time technical support person for every 300 computers; • At least one full-time LAN administrator per 40 servers; and • At least one full-time WAN administrator per 25 sites.	Publish "effective practices" for implementing efficient and effective technical support in local school systems, including programs for students to support technology in schools. (State, Local) Establish a differentiated response system for service requests that is based on the level of impact on the end users of the malfunctioning technology. (Local) Develop standards for the knowledge and skills needed by technical support staff. (State, Local) Provide ongoing training. (Local) Explore funding strategies to move toward meeting models for technical support and LAN/WAN administration. (State, Local) Consider providing incentives to encourage technical support staff to remain in schools and school systems rather than seek opportunities in the private sector. (State, Local, MBRT)	Online Technology Inventory of each school (annually) Technical support staff standards

Objective 5: Improve the Instructional Uses of Technology through Research and Evaluation

"As schools and districts strive to effectively implement technology, establishing a culture of continuous improvement is critical. Adjustments in policy and transformations of practice should be informed by ongoing evaluation supported by data collection and analysis, coupled with consistent implementation and bolstered by rigorous research."

Tim Magner, Director, Office of Educational Technology, U.S. Department of Education

Targets:

- Needs identified from an analysis of data from the Online Technology Inventory Report and other sources will be addressed through local school system Master Plans/Updates and Technology Plans.
- The State, in collaboration with the Maryland Business Roundtable for Education the Maryland Instructional Technology Advisory Council and local school systems, will monitor The Maryland Educational Technology Plan for the New Millennium.
- The State, in collaboration with the Maryland Business Roundtable for Education, the Maryland Instructional Technology Advisory Council and local school systems, will build capacity to evaluate instructional technology programs and initiatives related to the effective use of technologies for teaching and learning.

Progress to Date:

- The Annual Technology Inventory of every Maryland public school assesses technology capacity and use statewide. Digital Divide data charts are also available (see http://MD.OnTargetUS.com).
- The Maryland Business Roundtable for Education (MBRT) issues a report annually to the State Board of Education on the state of technology in the State's public schools as reported in the Maryland Technology Inventory and makes recommendations for improvements.
- The Maryland Instructional Technology Advisory Council was appointed by the State Superintendent of Schools to provide oversight on the Maryland Plan for Technology in Education.
- All Local School System and Consortia Grants spend a portion of the federal *Enhancing Education through Technology* funding on evaluation, often in collaboration with institutions of higher education.
- Through the Algebra/Data Analysis consortium and a MSDE federal grant, data are being collected on the design and effectiveness of the online Algebra/Data Analysis course.

Objective 5: Improve the Instructional Uses of Technology through Research and Evaluation

Targets for 2012	Recommended Actions	Data Sources
5.1 Local School Systems Bridge to Excellence Master Plans/Updates and Technology Plans will address needs identified from an analysis of data from the Online Technology Inventory Report and other sources.	Review planning documents for the inclusion of strategies to address local technology needs based on an analysis of data from the Online Technology Inventory Report and other sources. (State, Local) Conduct onsite visits and engage in ongoing dialogue with school systems to monitor progress toward goals and objectives of State and Local Technology Plans, to collect promising practices, and to ascertain technical assistance need. (State, Local) Seek funding and strategic partnerships to leverage resources. (State, Local)	Local School System Bridge to Excellence Master Plan and Update Documents Local School System Technology Plans Maryland Technology Inventory Maryland School Library Media Annual Report Local School System needs assessments and data collection results Local School Systems' *Enhancing Education through Technology* grant proposals
5.2 The State, in collaboration with the Maryland Business Roundtable for Education, the Maryland Instructional Technology Advisory Council and Local School Systems will monitor The Maryland Educational Technology Plan for the New Millennium.	Collaborate with the Maryland Business Roundtable's Committee on Technology in Education to provide oversight and advocacy for the State Technology Plan. (MBRT, State) Establish a continuous process for implementation, evaluation and revision of the State Technology Plan and appropriate State/Federal funding initiatives. (MBRT, State, Local) Maintain ongoing communication with stakeholders to provide information and build awareness of the strengths and challenges related to educational technology. (MBRT, State, Local) Develop strategies to demonstrate the need for funding sources to address educational technology requirements of the State and local school systems. (MBRT, State, Local) Review and revise the annual Online Technology Inventory and the School Library Media Annual Report and reporting process to reflect targets in both the revised State Technology Plan and the School Library Media Standards. (State, Local)	MBRT Reports Independent Evaluator Reports Maryland Technology Inventory Maryland School Library Media Annual Report Local School System needs assessments and data collection results

Targets for 2012	Recommended Actions	Data Sources
5.3 To build capacity to evaluate instructional technology programs and initiatives related to the effective use of technologies for teaching and learning, the State, in collaboration with the Maryland Instructional Technology Advisory Council and local school systems will: • Be informed about existing research on the effective use of technologies for teaching and learning; and • Conduct research studies, linked to national and state standards, to assess the impact of technology on teaching and learning by specific interventions such as: - New program and content implementation; - School reform models; - Instructional strategies for targeted subgroups and students at risk; - New models for professional development; and - Innovative models of instructional practice.	Establish a process that allows for the involvement of appropriate instructional and business services staff to collaborate to ensure that that technology-related decisions are based on sound educational practice and system needs. (MBRT, State, Local) Provide technical assistance and high quality professional development to MSDE and Local School Systems in understanding scientifically based research and in designing and conducting effective research. Extend these opportunities to Adult Education Programs within the system. (State, Local) Provide incentives for local school systems and schools to participate in research and evaluation activities, through state and federal grant programs and other initiatives. (State, Local) Encourage local school systems to partner with a third-party evaluator, such as higher education and/or evaluation organizations, to design and conduct the research for both internal and external evaluation. (State, Local) Earmark a percentage of grant funding for evaluation/research of related projects or initiatives. (State, Local) Research and pursue grant opportunities from a variety of sources to provide information about the impact of instructional technology on teaching and learning. (State, Local) Disseminate evaluation models and results of research through a statewide Website and state/national conferences to provide information about conducting quality research, to provide models of effective practice, and to improve the use of instructional technology in education. (State, Local)	Results of local and state Evaluation Studies State Evaluation Clearinghouse on MSDE website Program and grant evaluation reports for all Divisions at MSDE Maryland Conference Programs Local School System *Enhancing Education through Technology* Applications *Enhancing Education through Technology* Evaluations

Glossary

Authentic Learning Experiences: lessons and activities in which the student applies skills and knowledge to a real world practical situation.

Blog: an online journal comprised of links and postings in reverse chronological order. Alternatively called web logs or weblogs (derived from web + log).

Digital Content: text, data, sounds, and images, along with information about the content's form, function, and value, all stored as bits and bytes so that it can be easily identified and sorted. Digital content expands as its users build their knowledge.

Distance Learning Technologies: online courses, curricular materials, online support, online collaboration, Voice over IP, interactive cable casting, and video.

Distributed Learning: a general term used to describe a multimedia method of instructional delivery that includes combinations of electronic and traditional educational models.

Electronic Toolkits: resources created by Maryland educators, aligned with the Voluntary State Curricula, to offer instructional support. Toolkits include explanations of skills, ideas for lessons, student work samples, and links to resources.

Equivalent Access: the functional outcome of using a technology-based instructional product results in students with disabilities being able to access the same instructional content.
Hybrid Courses: the name commonly used nationwide to describe courses that combine face-to-face classroom instruction with computer-based learning.

Learning Management System: a software application or Web-based technology used to plan, implement, and assess a specific learning process and to facilitate the delivery of distributed learning (e.g., Angel, Blackboard, Desire2Learn, eCollege, and WebCT).

Learning Objects: modular digital resources, uniquely identified and metatagged, that can be used to support learning. The main idea of "learning objects" is to break educational content down into small chunks that can be reused in various learning environments.

Learning Object Repository: an accessible online location to store, search, and locate accurate digital resources and learning objects.

Lesson Seed: an idea for a lesson. The seed is directly aligned with an objective and ranges in cognitive demand. The sequential development of the lesson idea may begin at a lower level of cognitive demand and then evolve into a higher level of cognitive demand. Teachers may use the entire seed or only a portion of a seed based upon the capability of their classes.

Podcast: a non-music audio broadcast that has been converted to an audio file format for playback in a digital player such as an iPod or MP3 Player.

Portal Providers: entities that provide access points to a broad array of Web-based resources and services (e.g., Sailor, University of Maryland, Maryland Public Television, and Desire2Learn).

Return on Investment (ROI): a straightforward financial tool that measures the economic return of a project or investment. ROI gauges the effectiveness of the investment by calculating the number of times the net benefits (benefits minus costs) recover the original investment. In other words: what do I get back ('return') for the money I'm being asked to spend ('investment')? What is it really worth (the "ROI")?

Social Networking: the interrelationships of people in some manner, whether by family, work or interests.

Technology Inventory: an annual survey of all Maryland schools that reports hardware and connectivity, the capacity of Maryland students and teachers to access technology-based resources, technology knowledge and skills of teachers and how students and teachers use technology in their day-to-day teaching and learning.

Technology Literacy: the ability of an individual, working independently and with others, to responsibly, appropriately, and effectively use technology tools to access, manage, integrate, evaluate, create, and communicate information.
Total Cost of Ownership (TCO): the systematic quantification of all costs generated over the lifetime of a project. The goal of TCO is to determine a figure that reflects the total cost of the investment, including one-time purchases and recurring costs, not just the initial startup cost.

Universal Design: an approach to the design of products, services, and environments that is usable by as many people as possible regardless of age, ability, or situation.

Value of Investment (VOI): a Consortium of School Networking (CoSN) project to help schools to better understand the costs and benefits of proposed technology related projects. VOI looks at the anticipated costs and benefits of technology projects.

Weblog: see Blog.

Wiki: a Web application that allows users to add content, as on an Internet forum, but also allows others (often completely unrestricted) to edit the content. The term wiki also refers to the collaborative software (wiki engine) used to create such a website.

List of Acronyms

HSA: High School Assessment
http://www.marylandpublicschools.org/msde/testing/hsa

MBRT: Maryland Business Roundtable for Education
http://www.mbrt.org/

MPLERC: Maryland Public Library Electronic Resource Consortium
http://maryland.lib.overdrive.com

MSA: Maryland School Assessment
http://www.marylandpublicschools.org/MSDE/testing/msa/

MSDE: Maryland State Department of Education
http://www.marylandpublicschools.org/msde

MTTS: Maryland Teacher Technology Standards
http://www.mttsonline.org

MTLSS: Maryland Technology Literacy Standards for Students
http://www.mcps.k12.md.us/departments/techlit/

MVLO: Maryland Virtual Learning Opportunities
http://mdk12online.org/

TCO: Total Cost of Ownership
http://www.classroomtco.org/

TL8: Technology Literacy by 8th Grade
http://www.mcps.k12.md.us/departments/techlit/

VOI: Value of Investment
http://www.classroomtco.org/

VSC: Voluntary State Curriculum
www.mdk12.org/instruction/curriculum/index.html

Appendix A:
Alignment Resources

Education Article § 7-910: Equivalent Access for Students with Disabilities and COMAR 13A.05.02.13H (Accessibility of Technology-Based Instructional Products)
http://mlis.state.md.us/2002rs/billfile/SB0226.htm

The Governor's Commission on Quality Education in Maryland; September 2005 Report
http://ecpclio.net/megafile/msa/speccol/sc5300/sc5339/000113/000000/000600/unrestricted/20050867e.pdf

Local School System Curriculum Documents (refer to individual school systems)

Local School System Bridge to Excellence Master Plans
http://www.marylandpublicschools.org/MSDE/programs/Bridge_to_Excellence/

Master Plan and Update Guidance Documents
http://www.marylandpublicschools.org/MSDE/programs/Bridge_to_Excellence/

Local School System Technology Plans (refer to individual school systems)

Maryland Accommodations Manual
http://www.mcps.k12.md.us/departments/specialed/resources/AccManual.pdf

Maryland Adult Education Teacher Professional Development Standards

Maryland Business Roundtable for Education Recommendations (MBRT), March 2005
http://md.ontargetus.com/reports04/Presentation%20to%20State%20Board%20March%2022%202005%20.ppt#376,34,Recommendations

Maryland Instructional Leadership Framework
http://marylandpublicschools.org/NR/rdonlyres/BABBC-CE8-07F0-4C82-AB4E-FB8549E67474/9383/InstructionalLeadershipFrameworkFeb2006.pdf

Maryland Online Technology Inventory
http://md.ontargetus.com/

Maryland School Library Media Voluntary State Curriculum (Draft)
http://www.marylandpublicschools.org/MSDE/programs/technology/library_media

Maryland State Department of Education (MSDE) Strategic Plan
http://www.marylandpublicschools.org/MSDE/aboutmsde/department_info.htm

Maryland Teacher Professional Development Standards and Planning Guide
http://www.marylandpublicschools.org/MSDE/divisions/instruction/prof_standards

Maryland Teacher Technology Standards (MTTS)
http://www.mttsonline.org/ (standards)
http://www.bcps.org/offices/oit/ProfileDocuments.htm (resources)

Maryland Technology Literacy Standards for Student (MTLSS)
http://www.mcps.k12.md.us/departments/techlit

Maryland Technology Standards for School Administrators (Draft)
http://www.bcps.org/offices/oit/ProfessionalDevelopment/MarylandEdTechStandardsSchoolAdmin.doc (standards)
http://www.bcps.org/offices/oit/ProfileDocuments.htm (resources)

National Education Technology Plan: Toward a New Golden Age in American Education (2004)
http://www.ed.gov/about/offices/list/os/technology/plan/2004/plan.html

No Child Left Behind Act
http://www.ed.gov/nclb/landing.jhtml?src:pb

Partnership for 21st Century Skills
www.21stcenturyskills.org

Sailor: Maryland's Public Information Network
http://sailor.lib.md.us

School Improvement in Maryland
http://www.mdk12.org/

Voluntary State Curriculum and Toolkits
http://www.mdk12.org/instruction/curriculum/index.html

Appendix B:
Data Sources for Measurement and Evaluation

Annual Online Technology Inventory of each school

Annual Status Report to Legislature

Continuing Professional Development (CPD) Plan

(CPD) approval review

Curricular documents, lesson plans, teacher artifacts

Evaluation reports on completed professional development

Evaluation Studies and Results

Learning Object and Content Repository

Local and State Assessments

Local Policy and Procedure documents

Local School System Professional Development Plans

Local School System Technology Plans

Local School System Websites

Maryland Online Teacher Profile Tool

Maryland Teacher Education Program Approval Process

Monitoring management and operational efficiency

MSDE High School Committee Reports

MSDE Website content

Number of courses using advanced technologies related to STEM

Number of Maryland State approved online courses

Number of Maryland students enrolled in online courses (beginning 2002)

Number of online databases available in each county

Number of visits to the MSDE Website and user feedback

Online Technology Toolkit for Administrators

Program evaluation reports for all divisions at MSDE

Samples of student work

School Library Media Information Literacy Toolkit

Special Education Compliance Reports

Specifications on available systems

State Evaluation Clearinghouse and usage statistics

Student completion rate in courses using advanced technologies related to STEM

Students earning degrees in the fields of STEM and related teacher education

Teacher observations and evaluations

TL8 Student Toolkit

Usage statistics for (HSA) online courses and curricular resources

Usage statistics from online databases

Appendix C: Maryland Ed Tech Partnerships

Algebra/Data Analysis Collaborative

Overview:
The purpose of the Algebra Data Analysis Collaborative is to support the attainment of skills and knowledge in Algebra/Data Analysis through the use of e-Learning. The Collaborative will: (1) enhance the online resources for Algebra/Data Analysis in support of the Core Learning Goals and High School Assessment; (2) develop, pilot, and provide online professional development using a consistent protocol based upon the Maryland Teacher Professional Development Standards and focused on providing high quality professional development for teachers of Algebra/Data Analysis; (3) select and use a learning object repository in order to make the digital content from the online student course and professional development course accessible to Algebra/Data Analysis teachers; and (4) develop, pilot, and provide a process for online course design, development, implementation, and evaluation. See http://www.bcps.org/offices/oit/AlgColl.html.
Consortium Partners: Baltimore City and Baltimore (lead), Cecil, Frederick, Howard, Kent, Montgomery, and Washington Counties

Curriculum Management Systems (CMS)

Overview:
The purpose of the Curriculum Management Systems (CMS) partnership is to identify the use of web-based curriculum management tools to encourage the effective infusion of technology resources with curriculum development and to promote equity of access to curriculum resources. See http://www.pgcps.org/~support/cmsc.html.
Consortium Partners: Allegany and Anne Arundel Counties, Baltimore City and Dorchester, Frederick, Howard, Montgomery, Prince George's (lead), Washington, and Wicomico Counties

Generation Yes (GenY)

Overview:
The Maryland Gen Y Partnership promotes the effective use of technology in schools using the Gen Y model of professional development, while developing student leadership and fostering a collaborative, constructivist learning community among students and teachers. It gives students experience with educational technology, communication skills, and information literacy, allowing students to partner with teachers in building new curriculum materials and new teaching and learning practices.
Consortium Partners: Anne Arundel County, Baltimore City and Baltimore, Calvert, Cecil, Howard, Prince George's (lead), St. Mary's, Somerset, Washington, and Wicomico Counties

Learning Management Systems (LMS)

Overview:
The Learning Management Systems (LMS) project is researching LMS applications to track and manage staff development opportunities to increase staff knowledge and skills that ultimately impact student learning. The partnership will identify criteria and standards of an LMS and will pilot systems in consortium local school systems. The LMS will also host online courses and materials that can be used to enhance face-to-face instruction, such as hybrid or online courses. See http://carrollk12.org/admin/techservices/lms/.
Consortium Partners: Allegany County, Baltimore City and Baltimore, Carroll (lead), Dorchester, Frederick, Prince George's, Queen Anne's, Washington, and Wicomico Counties

Maryland Online Technology Profiles for Teachers and Administrators

Overview:
The purpose of the Online Technology Profiles for Teachers and Administrators grant is to develop, pilot and recommend separate technology profiling tools to determine teacher and administrator competencies, based on the Maryland Teacher Technology Standards (MTTS) and on the national Technology Standards for School Administrators (TSSA.). Professional development will be designed and implemented by partners based on results of application of the profiling tools. See http://www.bcps.org/offices/oit/Profile.htm.
Consortium Partners: Anne Arundel County, Baltimore City and Baltimore (lead), Carroll, Cecil, Harford, Howard, Kent, Montgomery, Prince George's, Queen Anne's, St. Mary's, Washington and Wicomico Counties

Maryland Students Online Consortium (MSOC)

Overview:
The purpose of the Maryland Students Online Consortium (MSOC) is to review, offer, evaluate, modify, and recommend online courses for Maryland Virtual Learning Opportunities Program (MVLOP). The implementation of the grant goals and objectives fall into two major activities: (1) the support of the work of the consortium itself as members meet to learn more about implementing local online programs for students; and (2) the support of state and local activities, including the provision of student courses and professional development to plan and implement online learning for students. See http://www.bcps.org/offices/oit/MSOC.htm.
Consortium Partners: Anne Arundel County, Baltimore

City and Baltimore (lead), Carroll, Cecil, Charles, Dorchester, Frederick, Harford, Kent, Montgomery, Prince George's, Queen Anne's, Somerset, Washington, Wicomico and Worcester Counties

Maryland Student Technology Literacy by 8th Grade (TL8) Consortium

Overview:
The Maryland Student Technology Literacy Consortium is a partnership focused on ensuring that all students are technologically literate by the end of eighth grade, a requirement of No Child Left Behind. The consortium will recommend a definition of and standards for student technology literacy in clear and measurable terms, a plan for teaching technology literacy skills, and a process for assessing student technology use and literacy. The consortium will seek key stakeholders' input, including business, higher education, and associations. Although the federal focus is on 8th graders, the consortium will address technology literacy for all students, grades Pre-k-12. See http://www.mcps.k12.md.us/departments/techlit.
Consortium Partners: All 24 local school systems.

MDK-12 Digital Library

Overview:
The purpose of the grant is to establish the MDK-12 Digital Library to provide equitable access to online resources by all students and educators in Maryland. The MDK-12 Digital Library Project will establish a purchasing consortium of 24 local school systems to provide a cost-effective way to deliver digital content that supports the teaching and learning of Maryland content standards in an equitable and timely manner for all students. Members will also design, conduct and evaluate collaborative professional development related to the appropriate use of online resources in connection with the Voluntary State Curriculum. See http://www.mcps.k12.md.us/departments/media/mdk12/.
Consortium Partners: All 24 local school systems

Project OPEN: Online Professional Education Network

Overview:
Project OPEN applies a coordinated, comprehensive approach to helping Maryland's school districts create and deliver online professional development courses. This approach addresses the historical duplication of courses from district to district which results in the wasting of scarce resources. It also addresses the growing interest of educators in professional development that is flexible and helps meet essential certification and technology skills requirements. Statewide standards for developing effective online courses will also be created. See http://www.pgcps.org/%7Eprojopen/.
Consortium Partners: Anne Arundel County, Baltimore City and Baltimore, Dorchester, Frederick, Montgomery, Prince George's (lead), Queen Anne's, Washington, and Wicomico Counties

Research Study: Cognitive Tutor – Algebra I

Overview:
Cognitive Tutor is an instructional technology research project evaluating the effectiveness of using the Cognitive Tutor Algebra I curriculum by Carnegie Learning to close the achievement gap among students on the Maryland Algebra/Data Analysis High School Assessment. The project will compare the achievement of students using traditional algebra textbooks with students spending 40% of instructional time learning concepts and skills on the computer and the balance of time collaborating to solve real world problems.
Consortium Partners: Allegany, Baltimore, Prince George's, Queen Anne's, Somerset, Talbot, Washington (lead), Wicomico, and Worcester Counties

SHORE Readers

Overview:
The objective of this project is to enhance student success on the Maryland High School Assessments by providing struggling readers with intensive reading intervention within a technology-based learning environment and by providing teachers with strategies for integrating reading and technology across the curriculum. The project will demonstrate the power of research-supported software for achieving literacy with adolescent struggling readers.
Consortium Partners: Caroline, Dorchester and Talbot (lead) Counties

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Appendix E:
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