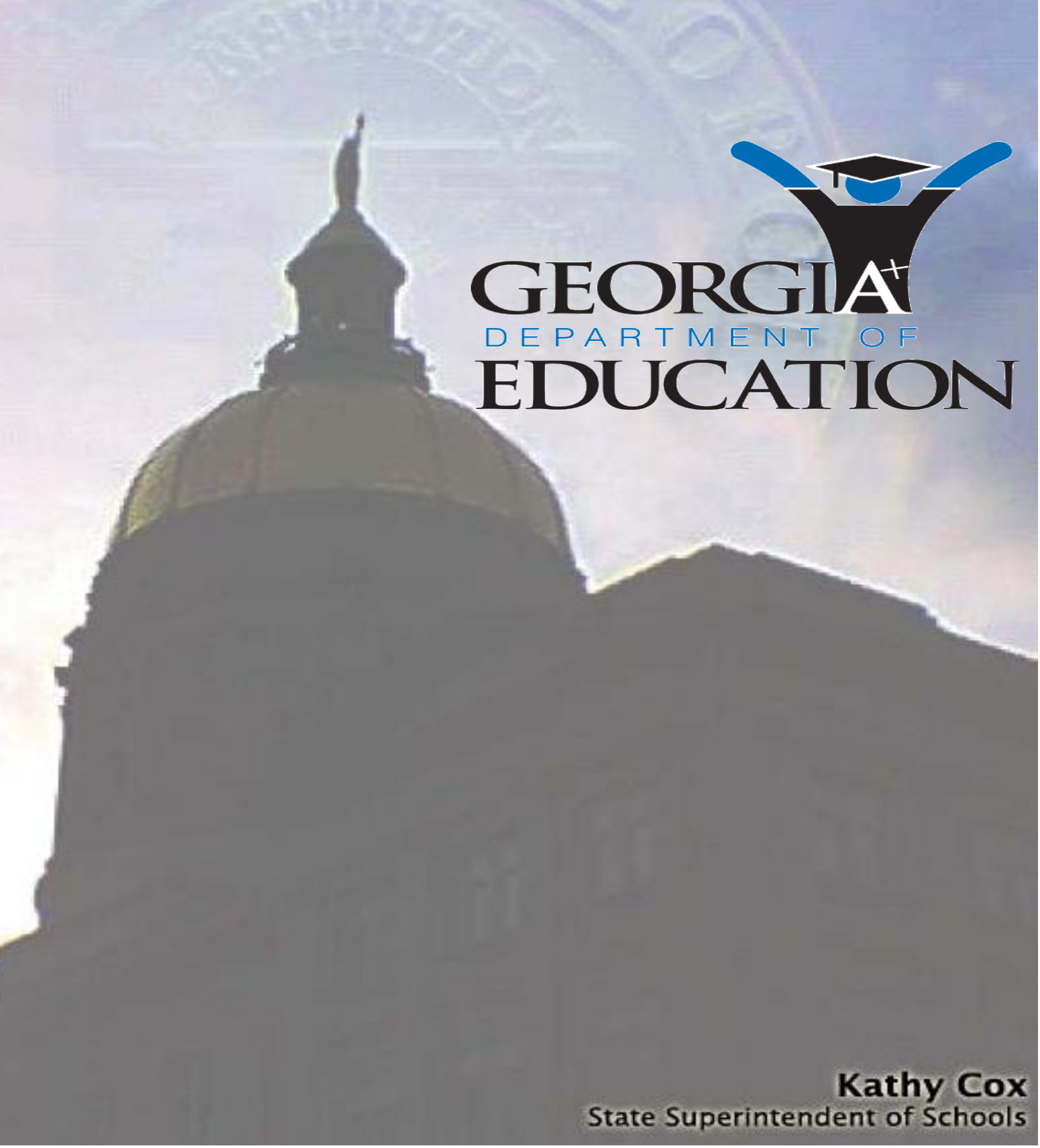

Georgia K-12 Technology Plan

Approved by the Georgia State Board of Education

A Collaborative Venture between the Georgia Department of Education,, K-12 Public School Systems, and Other Partners

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Section One: Introduction

Purpose

The purposes for the Georgia Technology Plan 2007-2012 include:

- To establish how technology can contribute to statewide goals for improving student achievement in Georgia's K-12 public schools.
- To provide a roadmap for implementation that includes goals, performance benchmarks, strategies, and evaluation.
- To publish common goals that will unite efforts of the Georgia Department of Education (GaDOE), other state-funded education agencies, local systems, and additional educational partners charged with improving education through technology.
- To meet federal No Child Left Behind Act of 2001 guidelines as well as state guidelines for having a State Technology Plan.
- To be used as a guide for federal and state instructional technology funding.

GEORGIA TECHNOLOGY VISION 2007-2012
Georgia will lead the nation in improving student achievement by ensuring that all educators and students have the knowledge and skills necessary to be successful in a global learning community.

Georgia Technology Goals 2007-2012
1. Increase broad-based community support for Georgia's ***vision*** to infuse 21st Century technology skills into the Georgia curriculum.
2. Increase ***educators' proficiency*** to use technology effectively in classrooms and administrative offices.
3. Increase effective ***instructional uses*** of technology in order to incorporate 21st Century technology and thinking skills into the Georgia curriculum.
4. Increase effective ***administrative uses*** of technology to monitor student achievement and to manage business operations in school systems.
5. Increase the capacity of school systems to provide the high-quality ***system support*** necessary to realize effective technology use, especially in the areas of administrative support for effective instructional technology use; professional development; technical support for hardware, software, network infrastructure, technology planning, and program evaluation.
6. Achieve and/or maintain ***equitable access to high-quality technology programs*** for all students.
7. Increase ***access*** for students, educators, parents, school board representatives, and other community members to technology resources that can enhance student learning.

Planning and Drafting Process

The 2007-2012 State Technology Plan development process began in the summer of 2005 with a series of working sessions at the GaDOE. Staff members evaluated the 2003-2006 State Tech Plan to determine where revisions and changes needed to occur.

In preparation for the revision of the Georgia Technology Plan, stakeholders representing local, system and state level interests were asked at the annual Georgia Educational Technology Conference to give input on topics such as:

- ✓ How can technology enhance K-12 education?
- ✓ What technology uses are most needed and/or desired in Georgia's schools over the next five years?
- ✓ What will it take to make these needs and/or desires a reality?

Based in part on the input from these stakeholders, a State Survey and a Best Practices Database were designed in spring, 2006. Using the thirteen Educational Technology Training Centers (ETTCs) as facilitators, the State Survey was administered through a series of individual and/or team interviews with system-level Technology Coordinators and teams of school and community leaders. This process was completed in the fall, 2006. The ETTCs also submitted possible names for inclusion in the Best Practices Database and gathered written and video documentation.

In April 2006, the process for collecting pertinent information and writing the 2007-2012 State Tech Plan was shared with the GaDOE Policy Committee and the GaDOE Cabinet as informational items. The State Survey questions were shared with these two groups at that time.

The results from the State Survey were compiled and analyzed by the faculty and staff of the Kennesaw State University ETTC in the winter of 2006-2007 in order to help describe the "Georgia Current Reality and Needs Assessment" section of the document.

Interviews were also held with GaDOE staff members from over twenty departments and divisions to determine how the 2007-2012 State Tech Plan could best reflect the on-going and up-coming priorities for the Agency.

In this way, participants provided the content for the vision, goals and objectives referenced in this document.

Drafts of the document were reviewed by members of the Instructional Technology and Media Division of the GaDOE, as well as outside professionals from the ETTCs and local schools systems. The draft was also re-submitted to the GaDOE Policy Committee and Cabinet for approval before being submitted to the Georgia State Board of Education for final approval.

After final approval by the State Board of Education, this document will be submitted to the US Department of Education as a condition under the Elementary and Secondary Education Title II, Part D: Enhancing Education Through Technology Act of 2001.

Section Two: National Technology Trends

The recent growth in information and communication technologies, including desktop and laptop computers, handheld devices, cell phones, portable video players, and the Internet, has transformed the world in which we live. In the last decade, our lives have changed sufficiently to suggest that children growing up today require a new and more demanding intellectual skill set in order to be successful in a global environment. As a result, many experts recommend that students' educational experiences be reformed to better prepare them for the future (U.S. Department of Education, 2006).

In order to achieve needed changes, it is important that states begin planning now. In Georgia, we are addressing this issue in a new five-year technology plan. In developing this plan, we first considered nation-wide technology trends in order to help us determine a direction for our state. In this national scan, five questions are addressed:

- **Are we, as a nation, making progress in integrating technology into K-12 education?**
- **Does research support the use of educational technology?**
- **Do we have a national vision for the role of technology in education?**
- **Do we have sustained national funding sources needed to financially support the technology needs of our schools?**
- **Are we teaching the 21st Century skills necessary for our students to succeed in a global environment?**

Are we, as a nation, making progress in integrating technology into K-12 education?

Consider these exciting advances: Nearly all schools in the United States now have connections to the Internet. The percentage of instructional computers with high-speed access is approximately 95 percent. Students are taking more tests on computers. Educators are making greater use of digital data on student achievement, particularly standardized-test scores. Digital cameras and video recorders are putting new, easier-to-use means of expression into students' and educators' hands. Interactive software

applications such as blogs, podcasts, and social networking sites are letting students and teachers easily post their own writings and multimedia presentations on the web. Digital whiteboards and liquid-crystal-display projectors are giving some classrooms a high-tech appearance. Virtual education is growing rapidly in many states. Hundreds of thousands of students go online for some or all of their courses, a trend that is opening up opportunities, such as Advanced Placement classes, that would otherwise be unavailable. In addition, teachers are turning in increasing numbers to the Web for professional development (*Technology Counts 2007*).

The following statistics give further concrete evidence that American schools are making great strides forward in the use of technology (*Technology Counts 2007*):

TECHNOLOGY IN UNITED STATES SCHOOLS (dates indicate most current data available)	
Percent of students with computer(s) in classroom (2005)	**49.5%**
Percent of students with computer(s) in lab/media center (2005)	**77%**
Students per instructional computer (2006)	**3.8**
Students per high-speed Internet-connected computer (2006)	**3.7**
Number of states with technology standards for students (2006-07)	**48**
Number of states that test students on technology (2006-07)	**4**
Number of states with established virtual schools (2006-07)	**23**
Number of states offering computer-based assessments (2006-07)	**23**
Number of states with standards that include technology for teachers (2006-07)	**45**
Number of states with standards that include technology for administrators (2006-07)	**36**
Number of states with that require initial licenses for teachers to include technology coursework or a test (2006-07)	**19**
Numbers of states that require an initial license for administrators to include technology coursework or a test (2006-07)	**9**
Number of states requiring technology training or testing for recertification, or requires participation in technology-related professional development (2006-07)	**5**

Yet for all the advances, American schools are not fully utilizing the tremendous power of technology in teaching and learning.

> A simple question to ask is, "How has the world of a child changed in the last 150 years?" And the answer is, "It's hard to imagine any way in which it hasn't changed." Children know more about what's going on the world today than their teachers, often because of the media environment they grow up in. They're immersed in a media environment of all kinds of stuff that was unheard of 150 years ago, and yet if you look at school today versus 100 years ago, they are more similar than dissimilar (Senge, 1990).

The editors of *Technology Counts 2007* suggest that, when evaluating the progress we are making in the utilization of technology in education, our educational leaders need to consider the following:

- Most states have technology standards for students and educators. But, few states test to see if those standards are being met, so the degree to which schools are reaching them is unknown.
- Teachers' integration of digital tools into instruction is sporadic.
- Internet use has exploded in the private sector, but not within our nation's classrooms.
- Many young people's reliance on digital technology in their outside lives stands in sharp contrast to their limited use of it in school.
- Large gaps have emerged in students' use of computers at home, based on their demographic backgrounds.
- Research showing technology's effectiveness in increasing student achievement remains elusive.
- 21st Century digital literacy must hinge not on the superficial fluency with technology that many students exhibit in their off hours, but on proficiency in such skills as effectively sifting through a glut of electronic information and producing creative work that will be valued highly in the global marketplace. Whether schools are on the right track in equipping students with these more sophisticated skills remains an open question.

We also need to remember that whether technology should be used in schools is no longer the issue in education. Instead, the current emphasis is ensuring that technology is used effectively to create new opportunities for learning and to promote student achievement. Educational technology is not, and never will be, transformative on its own. It requires the assistance of educators who integrate technology into the curriculum, align

it with student learning goals, and use it for engaging learning projects. Therefore, professional development for teachers becomes the key issue in using technology to improve the quality of learning (Killion, 1999).

In summary, few would argue that we are not making progress; however, schools are still a long way from leveraging technology's potential. It appears that now is an opportune time for making needed changes in the way teachers teach and students learn.

Does research support the use of educational technology?

As schools continue to spend an ever increasing amount of money on technology, many are beginning to question its value in increasing student achievement, particularly since the results from research studies are often mixed.

In a recently released, much anticipated study of reading and math software commissioned by the U.S. Department of Education, the results showed no significant differences in standardized test scores between students who used the technology in their classrooms and those who used other methods. Critics argue that they have serious concerns about the design and the conceptualization of the study titled "Effectiveness of Reading and Mathematics Software Products." The Consortium for School Networking (CoSN,) The International Society for Technology in Education (ISTE,) and the State Educational Technology Directors Association (SETDA) issued the following joint statement:

> "…technology has fundamentally transformed every sector in the United States economy. Parents understand the need for technology in schools, and kids live in a digitally-rich world. There is no question that our schools should reflect these realities. As we consider America's competitiveness, we cannot allow one narrow study to derail the progress technology in making in education in our 21st Century global economy." And, Phoebe Cottingham, whose U.S. Department of Education office commissioned the study, cautioned that the report should be used as "one input into people's decisions about how much, and where, to use education technology" (Trotter, April 11, 2007).

While there have been additional studies that have found no benefit in the use of educational technology, several recent research reviews and meta-analyses published in the United States and Britain show that, when measured across the board, educational technology yields "small, but significant" gains in learning and in student engagement. (Technology Counts 2007). In addition, the National Science Foundation, the Pentagon, and the U.S Department of Education have spent considerable funds on the research of computerized tutoring programs. Several of their studies suggest that, on average, students who participate in computerized tutoring make learning gains that roughly translate into the equivalent of as much as one letter grade. The research suggests the improvements seem greatest in the area of complex problem-solving and for students who start out with weaker subject matter skills.

The Metiri Group (October 2006) published their own results of a meta-analysis study on the use and effectiveness of classroom technologies. Their report summarizes general trends and representative studies in areas such as television and video use, calculators, engagement devices such as interactive whiteboards, portable or handheld devices, virtual learning, in-school computing, and one-to-one computing. Their purpose in doing the study was to provide educators with sound data about technological innovations that researchers say are working, as well as help school leaders make better decisions about technology investments. Their final report, "Technology in Schools: What the Research Says" gives evidence that technology does provide a noteworthy increase in learning across all uses and in all content areas when implemented consistently (Ascione, September 28, 2006).

Many argue that the primary reason research on the value of educational technology has not been more successful is because advocates have over-promised the

learning returns on technology investments in schools. Further, researchers have failed to investigate fully the potential of technology to augment learning. Instead, they have made the following four major miscalculations (Metiri Group, October 2006):

(1) being overly confident that they could easily accomplish the depth of school change required to realize the potential technology holds for learning;

(2) lacking effort in documenting the effect on student learning, testing practices, and system efficiencies;

(3) overestimating the time it would take to reach a sufficiency point for technology access; and,

(4) underestimating the rate of change in technology, and the impact of such rapid, continuous change on staff time, budgeting, professional development, software upgrades, and curricular and lesson redesign.

In addition, reports from the British Educational Communications and Technology Agency stated that technology research often uses small samples, does not always control the effects of variables other than technology, and is rarely exacting enough in its methodology or its search for explanations of findings. Furthermore, they argue that there are many researchers not using the correct Metirics and not measuring the full impact of learning (Cox, January 2004).

Thus, it appears that even as research studies are continuing, the real value of technology remains largely untapped in our schools today. And, while the research on the effect of technology is emerging and promising, more rigorous studies are definitely needed for it to demonstrate its full potential as a teaching and learning tool (Ascione, September 28, 2006)

Do we have a national vision for the role of technology in American education?

On January 7, 2005, the U.S. Department of Education released the National Education Technology Plan. This plan was developed with input from students, educators, researchers, parents, higher education, and industry leaders. Input provided

from these groups to a variety of forms, including in some cases, summaries of surveys or other consensus activities these groups undertook of their own memberships.

> "We cannot assume that our schools will naturally drift toward using technology effectively. We must commit ourselves to staying the course and making the changes necessary to reach our goals of educating every child. These are ambitious goals, but they are goals worthy of a great nation such as ours. Together, we can use technology to ensure that no child is left behind." - President George W. Bush

To help states and districts prepare today's students for the opportunities and challenges of tomorrow, a set of seven action steps and accompanying recommendations have been developed.

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

In addition, The Partnership for 21st Century Skills, a unique public-private organization formed in 2002 to create a successful model of learning that incorporates 21st Century skills into our system of education, has issued a call to action on this issue. This group strongly believes that we need a national vision for teaching and learning in the 21st Century and that now is the time. They emphasize three reasons (Road to 21st Century Learning, Partnership for 21st Century Skills, 2006):

(1) There is a growing sense of urgency about the future of the United States and its position as a world leader. Many feel that our nation must act now to ensure that future generations of Americans can participate fully in the democratic process and the competitive global economy.

(2) There is a broad consensus among educators, policymakers, business leaders and the public that schools must do a better job of preparing young people for the challenges and expectations of communities, workplaces and higher education.

(3) The No Child Left Behind Act of 2001 recognizes the urgency of improving public education. This federal law emphasizes student achievement and requires assessment in core subjects. Further, it requires students to be proficient in technology literacy by the eighth grade. Responding aggressively to this requirement with visionary policies will enable students to achieve the core competencies measured by NCLB.

Undoubtedly, our nation needs a compelling vision for education, including the use of technology for learning, teaching, and managing our schools, that will inspire education leaders, teachers, parents and students alike. Clearly, we must work together to fully prepare our students for the challenges of work and life in the 21st Century.

Do we have the sustained national funding sources needed to financially support the technology needs of public schools?

Many research studies have shown that educational technologies, when used properly and in coordination with a variety of school reforms, can enrich learning environments and enhance students' conceptual understanding. As a result, the federal government has embraced the potential of technologies to improve schooling and has played an important role in modernizing schools and their technical capacity by administering several programs to (U.S. Department of Education, October 2003):

- improve telecommunications and Internet access;
- purchase hardware and educational software;
- provide technology-related professional development and other technology supports; and,
- fund the research and development of innovative uses of technology for educational purposes.

The vast majority of this federal funding for educational technology comes from two sources; (1) the E-rate program and (2) the Enhancing Education through Technology program (EETT) (U.S. Department of Education, 2003).

The E-rate program is administered by the Schools and Libraries Division (SLD) of the Universal Service Administrative Company (USAC) and seeks to improve access to digital technology by providing approved schools and libraries with discounts ranging

from 20 to 90 percent on qualifying telecommunication services. Discount rates are based on the percentage of students eligible for participation in the National School Lunch program and on whether the school or library is located in a rural area. The E-rate program supports the acquisition of digital technology infrastructure, including telephone services, Internet and website services and the purchase and installation of network equipment and services. E-rate has made statistically significant increases in the proportion of schools connected to the Internet; the number of phones per student; the number of Internet-connected computers and Internet connection per student; and the speed of Internet connections (U.S. Department of Education, 2006).

The second major technology funding source for public schools is the Enhancing Education Through Technology (EETT) program, authorized by Title II, Part D, of the Elementary and Secondary Education Act of 1965 (ESEA), as amended by the No Child Left Behind Act of 2001. The EETT legislation provides formula grants to the states for promoting the use of educational technology to improve student achievement. States, in turn, provide formula and competitive grant awards to districts within their state. For the first time in FY 2006, state EETT officials were given the opportunity to award all funds through competitive provisions due to the decrease of funding available to the program at the federal level. Of interest in the future will be the degree to which states embrace this opportunity and the ways it appears to influence program operation (U.S. Department of Education, 2006).

Even though these two major funding sources have made a huge impact on the technology available in schools across our nation, neither can be considered secure funding sources. There has been much political debate that the E-rate funds not continue

to exclusively fund technology for schools. The funding for EETT is in more direct danger of being lost. Since 2004, funding has been significantly cut each year.

Total funding in 2004 - $659,438,400.00	Georgia - $20,179,473.00
Total funding in 2005 - $479,840,235.00	Georgia - $15,158,492.00
Total funding in 2006 - $264,343,625.00	Georgia - $8,462,015.00
Total funding in 2007- $262,890,721.00	Georgia - $8,291,373.00
Total proposed funding in 2008 - $0.00	Georgia - $0.00

In summary, the federal government's financial support of technology in K-12 schools is vital to the continuing proliferation and integration of technology in K-12 schools; however, the funding future is very uncertain. As the reauthorization of the NCLB Act of 2001 continues, we look to the congressional leaders to recognize the importance of educational technology in student achievement.

Are we teaching the 21st Century skills necessary for American students to succeed in a global environment?

Despite the considerable progress that states have made in raising academic expectations, K-12 education is still predominately stuck in the 20th Century. Mastering the core content, which has been the focus of most school improvement efforts to date, is just the beginning. The urgent challenge for state leaders today is to move education forward with a 21st Century skills initiative. This move will assist innovative leaders with their desire to give young people the edge they need to compete successfully in a global economy (A State Leaders Action Guide to 21st Century Skills, Partnership for 21st Century Skills, July 2006).

Echoing this message is the Organization for Economic Cooperation and Development (2004), a group which maintains that dynamic forces are at work in schools today. Members argue that students must master skills like analytical thinking and problem solving, along with the effective use of technology, if they are to succeed in

work and life. They must learn how to access data and resources efficiently. In addition, they must learn how to collaborate and interact with peers, people and teachers across the room, and around the globe. Students suddenly are competing not just with their neighbors, but also with students from around the world. As workers, they must learn constantly to update their skills and adapt to an ever-changing work environment, or they will become obsolete.

In June 2007, the International Society for Technology in Education (ISTE) released a new version of the National Educational Technology Standards for Students (NETS-S) which focuses more on skills and expertise and less on tools. Specifically, they address

- creativity and innovation;
- communication and collaboration;
- research and information fluency;
- critical thinking, problem-solving, and decision-making;
- digital citizenship; and
- technology operations and concepts

The standards, used in every U.S. state and many countries, are credited by most with significantly influencing expectations for students and creating a target of excellence relating to technology. (ISTE – National Educational Technology Standards)

Part of the great strength of the United States is its adaptability. Since technology, information, and knowledge are constantly changing, learning and thinking skills, technology literacy, and life skills are the best legacy that K-12 education can impart to this and future generations of young people. These skills will empower them to find, manipulate and use content to learn, solve problems, create and think for a lifetime. In fact, 21st Century skills are the powerful means by which students can make effective use

of their content knowledge. However, these skills do not develop automatically in the course of mastering core academic content. Rather, core subjects need to integrate them explicitly.

State education policy-makers need to move forward with a new direction for teaching and learning in the 21st Century. They can begin by evaluating their existing standards, curricula, and assessments and redefining them to address the demands for new skills for students. The Partnership for 21st Century Skills (State Leaders Action Guide to 21st Century Skills, July 2006) urges state leaders to:

- recognize that there are results that matter for students in the 21st Century and those results are different from and go beyond traditional Metirics;
- redefine "rigor" to encompass not just mastery of core subjects, but also mastery of 21st Century skills and content; and,
- plan and implement a 21st Century Skills Initiative that includes the following six key elements.

SIX KEY ELEMENTS OF 21ST CENTURY LEARNING	
Core Subjects	**The NCLB Act of 2001 identifies the core subjects as English, reading or language arts; math; science; foreign languages; civics; government; economics; arts; history; and geography.**
21st Century Content	**Several significant, emerging content areas are critical to success in communities and workplaces: global awareness; financial, economic, business and entrepreneurial literacy; civic literacy; and health and wellness awareness.**
Learning and Thinking Skills	**These skills are comprised of critical thinking, communication, creativity, innovation, collaboration, contextual learning, information processing, and media literacy.**
ICT Literacy	**Information and communications technology (ICT) literacy is the ability to use technology to develop 21st century content knowledge and skill, in the context of learning core subjects.**
Life Skills	**Life skills include leadership, ethics, accountability, adaptability, personal productivity, personal responsibility, people skills, self-direction, and social responsibility.**
21st Century Assessments	**Authentic 21st century assessments must measure all five results that matter: core subjects; 21st century content; learning and thinking skills; ICT literacy; and life skills.**

Even though technology is specified in only one of the above elements, it plays a significant role in all the others as well. For example, many teachers consider technology tools as essential in their classrooms since they have found that incorporating technology into their core subject lessons increases student engagement and knowledge retention.

Since 2002, the Partnership for 21st Century Skills has been working with states and communities to reinvigorate learning to meet the demands of this century. Based on this work, the Partnership recommends six strategies for leaders interested in developing a successful statewide 21st Century Skills Initiative (July 2006):

1. Develop a powerful, shared vision with a broad consensus;
2. Make sure that state standards incorporate 21st Century skills;
3. Develop assessments that align with 21st century standards;
4. Make sure all students have equal access to 21st Century tools and instruction;
5. Support professional development in 21st Century skills for teachers and administrators; and,
6. Make the development of 21st Century skills a priority and allocate resources accordingly.

Strategy number five in particular bears further scrutiny. In order to develop student proficiency in 21st Century Skills, we must also prepare our teachers and administrators. According to *Technology Counts 2007*, there has been a nationwide effort to establish technology standards for pre-service and in-service teachers. Currently, forty-five states have technology standards for teachers and thirty-six also have established administrator standards. In June 2008, ISTE plans to unveil a refresh of the National Educational Technology Standards for Teachers. In creating this set of standards, "these develop a comprehensive set of performance-based technology foundation standards for all teachers reflecting fundamental concepts and skills for using technology to support teaching and learning." (ISTE NETS-T)

Unfortunately, this trend has not been reflected in technology competency requirements for initial or recertification licensure for either educators or administrators. Only nineteen states require that teachers pass some form of computer competency assessment for initial certification and only nine require the same of administrators. The statistics for re-certification are even smaller, with only nine states requiring teachers to demonstrate competency and five states requiring proof of competency for administrators.

It is hoped that these numbers will increase in the coming years. Demonstrated standards and on-going competencies for teachers and technology leaders are critical to the development of new learning environments for the integration of technology. Teachers must be well-prepared in order to effectively integrate technology into their curriculum and shift teaching paradigms to a performance-based, student-centered learning environment. Administrators must be well-prepared in order to correctly evaluate the 21st Century learning environments, and to encourage and support the technology integration.

Based on the above analysis, many leaders from both the public sector and public education are beginning to realize that we need to begin planning now for a 21st Century Skills Initiative that reflects a vision for learning that will prepare every student for success in the 21st Century.

Section Three: Georgia's Current Reality and Needs Assessment

The Georgia Department of Education's Office of Technology Services consists of two primary divisions, serving under the direction of a Deputy State School Superintendent: (1) Information Technology and (2) Instructional Technology and Media.

The first division manages the technical support for both Georgia schools and the GaDOE and builds infrastructures that deliver information to key decision makers. The technical staff members develop, promote, and provide technical assistance for administrative applications for technology including: interactive reports, online standardized testing, electronic grant application programs, student information systems, online data collections, and web-enabled consolidated application for funding.

The Instructional Technology and Media division works collaboratively within the GaDOE to accomplish the State's mission by changing classroom instruction through the effective use of technology. To achieve this, Georgia schools will spotlight 1) performance-based curriculum; 2) assessment and analysis of student data; 3) 21st century learners; 4) 21st century learning environments; 5) differentiated instruction; and 6) high quality teachers and leaders. In addition, the Instructional Technology and Media division oversees the Title II, Part D Educational Technology grants, the Georgia Virtual School, and the GeorgiaStandards.Org program, which is a collection of dynamic, interactive, online resources available to all Georgia educators.

In developing a new, five-year technology plan for the state, the technology division began by exploring national trends. We found it helpful to report the results of our research using five questions. As we were beginning to formulate our state plan, we

decided to utilize the same five questions to determine Georgia's status and identify issues that we need to address.

- **Are we, as a state, making progress in integrating technology into K-12 education?**
- **Does state research support the use of educational technology?**
- **Do we have a state vision for the role of technology in education?**
- **Do we have sustained state funding sources to support the technology needs of our schools?**
- **Are we teaching the 21st Century skills necessary for our students to succeed in a global environment?**

Are we, as a state, making progress in integrating technology into K-12 education?

Based on the results recently published in *Technology Counts 2007*, we believe that we can state unequivocally that our schools are making progress in utilizing technology. This year for the first time, Georgia was the only state to receive an "A" and was given the highest rating in the nation, compared with the 49 other states. We received a 96 out of a possible score of 100. The entire report can be found online at *www.edweek.rg/go/tc07*. Some of the report highlights were:

- 65% of Georgia students have a computer in the classroom, higher than the national 49.5% average.
- Georgia is among four states that have implemented technology standards into curriculum standards and tests on those standards.
- The state is one of 23 states that offer a virtual school, where students can take classes online.
- Georgia is one of very few states that have technology requirements for teachers and administrators seeking certification or recertification.

Georgia and U.S. statistics are compared in the following chart:

TECHNOLOGY LEADERS: GRADING THE STATES **(dates indicate most current data available)**	**US**	**GA**
Percent of students with computer in classroom (2005)	**49.5%**	**65%**
Percent of students with computer in lab/media center (2005)	**77%**	**85%**
Students per instructional computer (2006)	**3.8**	**3.8**
Students per high-speed Internet-connected computer (2006)	**3.7**	**3.7**
Number of states with standards for students that include technology (2006-07)	**48**	**Yes**
Number of states that test students on technology (2006-07)	**4**	**Yes**
Number of states with established virtual schools (2006-07)	**23**	**Yes**
Number of states offering computer-based assessments (2006-07)	**23**	**Yes**
Number of states with standards that include technology for teachers (2006-07)	**45**	**Yes**
Number of states with standards that include technology for administrators (2006-07)	**36**	**Yes**
Number of states that require technology coursework or a test for an initial teaching license (2006-07)	**19**	**Yes**
Number of states that require technology coursework or a test for an initial administrative license (2006-07)	**9**	**Yes**
Number of states requiring technology training or testing for recertification, or participation in technology-related professional development (2006-07)	**5**	**Yes**

When announcing this *Technology Counts 2007* honor, State School Superintendent Kathy Cox stated: "In Georgia, we are not only teaching our students about technology, we are using technology to teach our students. Technology is one of the keys to making sure our students are ready to compete in the 21st century." In addition, she reported, "Georgia is using technology to give every student access to an excellent education no matter who they are or where they live. From the halls of the Capitol to the hallways of our schools, our state knows how important technology is to student achievement. We will continue to look for ways to expand use and access to technology" (GaDOE Press Release, April 2007).

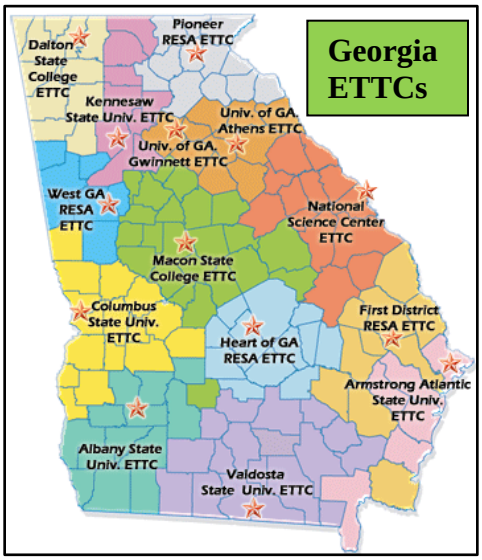
In addition to the *Technology Counts 2007* report, the GaDOE is very proud of several highly successful technology initiatives. One of these promising initiatives is our state website for educators: *GeorgiaStandards.Org*. The Center for Digital Education recently named *GeorgiaStandards.Org* the 2007 Best of the Web (BOW) winner in the K-12 State Web Site category. Hundreds of website entries were evaluated on innovation, Web-based delivery of public services, efficiency, economy and functionality. Though just over a year old, the GSO portal tools have accommodated the publication of over 700 instructional plans, and enrolled over 8,000 teachers giving them access to the GSO collaborative group environment.

The goal of *GeorgiaStandards.Org* *is* to provide a dynamic, interactive, online resource that will enhance and support teaching and learning in Georgia with the Georgia Performance Standards as the main focus. Georgia teachers are committed to meeting the educational needs of their students and increasing student achievement; and *GeorgiaStandards.Org* provides the resources needed to assist teachers in their efforts. *GeorgiaStandards.Org* prides itself on getting standards aligned resources into the teachers hand in minimal time. In September 2007, more than 91,000 unique visitors came to the *GeorgiaStandards.Org* web site over 170,000 times, spent an average of 6 minutes onsite, and viewed just under 1,000,000 pages.

GeorgiaStandards.Org continues to improve communication and expand access to learning resources for students, parents and teachers. Not only is our state's public using *GeorgiaStandards.Org* as the place to access our state standards, but also educators across the nation are looking to Georgia as a community reinforcing educational "best practices."

The *Georgia Virtual School* is another thriving technology initiative of the Department of Education. One measure of its success is enrollment, which has grown exponentially each year since its inception. From the initial year of the program in 2005-2006, the enrollment of 2,290 segments the program has grown to anticipating 5,634 segments in the 2007-2008 school year. This online program provides opportunities and options for all Georgia students to engage in over 80+ courses including Advanced Placement, Advanced Placement Practice Exams, Credit Recovery, College Preparatory, Career and Technical, Middle School Remediation, and other electives online to enhance their learning experiences. Courses are taught by any of the 172 highly qualified, Georgia certificated educators trained specifically to teach in the online medium. Under the state and local rules established to govern the program , students can take classes as a part of their regular school day for no cost. In addition, supplemental classes may be taken during fall, spring, and summer semester for tuition.

A third initiative from which the teachers in Georgia benefit are the Educational Technology Training Centers (ETTCs). Since 1993, Georgia's thirteen (13) ETTCs have fulfilled the Georgia Department of Education's (GaDOE) commitment to provide technological expertise and support to educational initiatives serving Georgia's schools, teachers and students.



The ETTCs operate under the direction of the Instructional Technology Division of the GaDOE, providing professional learning, consulting, and service for Georgia educators. The primary mission of the ETTCs is to promote the appropriate use of

technology in support of teaching, learning, and leadership in Georgia schools. Providing high-quality professional learning to schools statewide, the ETTCs are housed at Georgia universities, colleges, RESAs, and the National Science Center. The geographic service areas of Georgia's 13 ETTCs permit responsive, regional support for Georgia schools. One of the most visible and successful statewide initiatives led by the ETTCs was the implementation of House Bill 1187, requiring all teachers in the state to complete Georgia's Special Technology Requirement. The ETTCs developed and delivered InTech to over 70,000 Georgia educators.

Although the ETTCs were originally conceived as technology training centers, their role has evolved to include the delivery of statewide initiatives, such as implementing the Georgia Performance Standards (GPS), assisting schools in tracking and reporting federally-mandated AYP data, supporting DOE's online portal (GeorgiaStandards.Org), monitoring and implementing state and federal technology-related grants and programs (Title II-D and E-Rate), and building statewide technology awareness and capacity by supporting the Georgia Educational Technology Conference (GaETC). Other statewide initiatives facilitated by the ETTCs include training on Cognos, GaDOE portal, Graduation Coach Management System, Data Utilization Guide, and the Online Assessment System. In addition, the ETTCs provide technical training in network administration, network security, wireless network administration and security, computer forensics, and more.

ETTCs	Teachers served	Admins served	Curr Dir served	Student Info Serv People Served	*Pre-Service Teachers served*	University Faculty served	Other**	TOTALS
2006-2007TOTALS	30111	7589	1142	4270	2477	652	3403	49644
** Other - GaDOE, Media Specialists, Private Schools, Students, Parents, Community, etc.								

The ETTC initiative significantly contributed to Georgia receiving the only "A" grade in the nation in technology implementation in *Education Week's* special

Technology Counts 2007 edition. Georgia is fortunate to have the ETTCs providing outstanding leadership and vision to schools and districts in the effective use of technology in support of teaching, learning, and leadership.

The GaDOE's Statewide K-12 Network provides the backbone for effective instructional technology implementation in Georgia. Educators and students utilize the internet connections provided by the GaDOE on a daily basis to access the web and run applications for direct student learning.

As the Internet becomes more and more robust, the students' ability to capture and manipulate the information and data becomes more and more complex. It is more and more difficult for teachers to be effective without the resources available via electronic connections. Students are collecting real-time data from scientific probes and transferring that data to laptops to run calculations and manipulations. Mathematical problems are completed on a TI calculator and the answers are transmitted to a teacher laptop for assessment purposes. Student multi-media productions are created and shared via local networks and in more and more cases, students are able to access electronic resources from home and continue their learning on an anytime anywhere basis.

Students use the Internet constantly for researching and collaborating purposes. As more and more educators are shifting their instructional paradigms to a student-center, project-based learning model, students need real-time, immediate data that is only available via the web. Electronic databases are accessed through GALILEO, Georgia's Virtual library, in every school in the state. GALILEO provides equitable access across the state, no matter where the student is located and contributes to the leveling of the digital divide amongst our K-12 students.

Teachers and students gain access to rich collections of more than 50,000 video segments from among 5,000 full-length educational videos from award-winning producers, with more than 1,000 new titles added every year. Schools stream and download video content directly from the Internet. In many cases, the content of these resources directly correlates to the Georgia Performance Standards and plays an important role in improving student achievement.

With the advent of Web 2.0, students can collaborate with others from around the world to discuss, debate, and solve relevant issues. With the Statewide K-12 network as the infrastructure, Georgia students can compete academically with their contemporaries from China, India, Japan and Europe in a facilitated environment that allows them to explore, learn, and challenge themselves. Learning is no longer confined to the desk and chair in the classroom; it extends around the world and even out into space.

The Georgia Department of Education recognizes the need to support administrative technologies. Currently, all required school and system-level data collections are online processes, and there is a technology help desk to provide technical assistance to educators in local systems.

The Georgia Department of Education Data Warehouse has been designed to be an integrated, historical database. The GaDOE Data Warehouse was created using data from the 2005-2006 school year and it will continue to be fed with each school year's data. Users can perform analyses at the state, district, school, and student level to inform and benefit their school improvement efforts. Incorporated with this data warehouse is a powerful business intelligence tool that creates the reports accessed through the GaDOE secure Portal. This business intelligence tool may be used in future releases of data to create ad hoc reports for analysis of students' progress over time.

The GaDOE Data Warehouse contains student data from the Student Record (SR) data collection. The data warehouse uses the new GTID (Georgia Testing ID) as the primary identifier for a student. This data collection occurs at the end of the school year and includes summative data for all students that attended a Georgia public school at any point during the school year. Also contained in the GaDOE Data Warehouse is teacher and administrator data from the school year. Using this tool, users can both examine trends in education and testing data across several years and benchmark groups for comparison purposes. Such efforts have established technologically-advanced cultures that not only understand and support technology, but also use technology to produce actionable data targeted at school improvement.

Based on the above data, it is clear that the state of Georgia is a national leader in the field of educational technology; however, we are only on the threshold of what we expect to accomplish within the next five years.

Does state research support the use of educational technology?

The state of Georgia recognizes the importance of research in documenting the success of technology integration in schools. In past years, research has been conducted mostly on a local level. However, through a four-year Title II, Part D competitive grant focusing on increasing student achievement in mathematics by improving classroom access to modern learning technologies, and enhancing educators' understanding of scientifically-based research and evaluation encouraged by NCLB, the state of Georgia is compiling data that will offer positive evidence of technology's impact.

Beginning in Round 5, FY06, the State made the decision to award 100% of its Title II, Part D funding on a competitive grant basis and built in an evaluation component to the grant process. All schools awarded Title II, Part D grant monies participate in an

evaluation process conducted by an outside evaluator using scientific research principles. In 2007-2012, we will continue this requirement. We have many exciting projects going on in Georgia in the field of education technology; however, funding for educational research studies to document successes in raising student achievement has not been a priority in recent years. By implementing the required outside evaluation, we can add to the body of much needed research in this field.

Do we have a state vision for the role of technology in education?

In the State of Georgia 2003-2006 Technology Plan, which was approved by the State Board of Education in July 2003, we devised and supported a credible technology vision for our state. It focused on the principle that frequent uses of research-based instructional and administrative technologies would help Georgia lead the nation in improving student achievement in core academic areas by enhancing the technology literacy of students, parents and educators and would develop a highly-qualified workforce for the 21st century. During the implementation of this plan, it was clear that the GaDOE instructional initiatives of GeorgiaStandards.org, Georgia Virtual School, and the 13 ETTCs were instrumental in developing and sustaining student and educator successes on the local level. In addition, the informational initiative of the Georgia Data Warehouse provided administrators with a powerful tool to analyze and utilize data to improve student achievement.

It is clear that GaDOE staff, system-level technology staff and business education partners have a high degree of ownership of and commitment to the vision. It is also important that as Georgia strives to achieve a full implementation of technology goals across all settings, it will be necessary to assess more tightly the commitment to the vision across a broader community.

The State of Georgia understands that much has changed in the four years since the 2003-2006 Technology Plan was written. There is a new emphasis on 21st Century skills for our students. As more and more students in Georgia use local resources to access global learning communities, there is a need to collaborate and coordinate student achievement and school improvement efforts across the Agency. The Office of Technology Services and its Divisions of Instructional and Information Technology will work collaboratively within the GaDOE to accomplish the State's mission by changing classroom instruction through the effective use of technology. To achieve this, Georgia schools will spotlight 1) performance-based curriculum; 2) assessment and analysis of student data; 3) 21st century learners; 4) 21st century learning environments; 5) differentiated instruction; and 6) high quality teachers and leaders.

Do we have sustained state funding sources to support the technology needs of our schools?

Like leaders on the national level, state business and political leaders are feeling an increasing sense of insecurity about the long-term financial future of Georgia and realize the important role education plays in our economic success. In addition, there is public buy-in to the idea that schools need to improve. Finally, the No Child Left Behind Act of 2001 emphasizes student achievement and more people now believe that technology can play a key role in this process.

The majority of funding for technology in Georgia comes from two federal funding sources, one of which is E-Rate. Since the inception of E-Rate in 1997, the Georgia Department of Education (GaDOE) has filed for and received over $500 million in E-Rate funding to build the Statewide K-12 Network. Although there is a great deal of money for schools available through E-Rate for telecommunications infrastructure and the purchase and installation of network equipment and services in the schools, the

process is somewhat complex and timing of certain forms and applications is critical. The Instructional Technology and Media Division assists school systems with the filing process so that maximum funding can be obtained.

Georgia's second major funding source from the federal government is utilizing EETT (Title IID) funds made available through the No Child Left Behind Act (2001). From these funds, GaDOE provides grants to local educational agencies on the basis of their proportionate share of funding under Title I, Part A. The Georgia Department of Education retains 5% of its total Title II, Part D allocation for state-level activities, and currently distributes the remainder competitively to eligible local educational agencies (LEAs).

In 2005-2006, because of changes to the Title II, Part D law, states could now realign their funding to make the biggest impact. The decision was made to eliminate formula funding because the numbers showed that more than 805 of the school districts within the State of Georgia would receive less than $20,000. Georgia decided to allocate 100% of the Title II, Part D funding to competitive grants where a more significant impact could be felt across the state. This decision also allowed the State of Georgia to control the use of the funding and support research and evaluation to document the impact on student achievement. Depending on future funding levels and any changes to the Title II, Part D program through the reauthorization of the NCLB Act of 2001, we may continue to allocate funds competitively or return to the use of both competitive and formula grants.

In addition, school systems receive state funding based on student population to hire technical and instructional technology support personnel to staff their schools. Currently, no state funds are appropriated for the acquisition of instructional technology

in schools. Many feel that schools should be given more funding for the hiring of support staff and the purchase of new technologies. At the current time, systems are dependent on local funding to cover these necessary expenses.

Furthermore, we need state funding to ensure continuing improvement in the Georgia Statewide Data Warehouse to allow for the evaluation of the effectiveness of various education programs and interventions, to track student achievement, and to equip school leaders with reliable data that allows for data-driven decision-making and instruction.

Finally, the following major GaDOE initiatives currently receive state funding: Georgia Virtual School, GeorgiaStandards.org, GALILEO - Georgia's Virtual Library, and the 13 ETTCs. These programs play a vital role in the improvement of student achievement.

The GaDOE Office of Technology Services works hard to identify and apply for outside grant opportunities that might benefit the students in Georgia. In the past two years, we have formed partnerships with other Agency offices to leverage the limited funding available. In collaboration with the Office of Standards, Instruction and Assessment, the Math Science Partnership (MSP) Program: Title II, Part B is creating opportunities for professional learning in the math and science content areas. Several ETTCs are providing some of that professional learning and integrating technology into those curricular areas. The ETTCs have consulted with their local systems to take advantage of Title I funding to compliment their technology integration initiatives.

As a state, Georgia must determine how and where it will systematically support the integration of technology in our schools. Currently, there are not enough state dollars

allocated for this purpose; thus, long range planning and sustained funding sources need to be established.

Are we teaching the 21st Century skills necessary for our students to succeed in a global environment?

It is important to document the importance of the Library Media Specialist in the life of the 21st century school. The library media center is the hub and heart of the school. The Media Specialist is not only the teacher in this very large classroom, but also serves as the information and instructional specialist and the technology consultant to the faculty, staff and students in his/her school. Many state studies have proven that there is a direct correlation between student achievement and an active, up-to-date library media center. Today's Media Specialist is the information specialist in the school and is more vital than ever before.

Digital resources play an increasingly important role in the school and the Media Specialist is the manager of these important databases. Every Georgia school has access to GALILEO, Georgia's Virtual Library, and the wealth of information it has, but many schools choose to add additional materials and databases. Digital materials must be selected to meet the needs of the school, the curriculum, and the teachers. The Media Specialist has the skills, training, and knowledge to choose both appropriate print and non-print material including databases and technology resources. As schools change and traditional classrooms evolve so that more students have time to spend beyond the rows of desks, library media centers become even more essential.

In October 2007, the Media Services program and staff moved from the Division of Instructional Technology to the Division of Curriculum and Instruction. This was a direct response to the fact that in Georgia, the Media Specialists are involved in collaboration efforts at the curricular level with content and grade level teams. They

participate in and lead discussions on effectively integrating technology into the daily lessons and units. Some Media Specialists design and teach professional learning activities to their building and/or district educators.

Working with the classroom teachers, the Media Specialist can help design projects that cross disciplines, help students develop skills to solve problems, and direct students to multiple sources of information (both print and non-print). Students in the media center can experience an entire world of resources right at their fingertips. Because some students only have access to the Internet at their school or public library, it is vital that the media program and Media Specialist incorporate technology into the curriculum. By keeping the strong connections between Media Services and Instructional Technology, the GaDOE is committed to ensuring that library media centers provide a critical place for student-centered learning.

Georgia educational leaders realize that our schools must keep in step with a global society that is becoming increasingly dependent on the use of technology. However, in recent years, according to Hokanson and Hooper (2004), too much emphasis has been placed *on learning from technology* rather than *learning with technology*. Even though computers currently offer a great deal in terms of instruction and the management of student data, the focus is shifting to how to utilize technology to improve student achievement. For Georgians to adopt this new focus, we need to shift to a 21st Century learning paradigm.

To explore where we are in Georgia in regards to this new paradigm, state GaDOE leaders determined that we needed to gather information from our school systems.

A state-wide survey was developed and administered based on the following subjects:

- **21st Century Instructional Practices**
- **Digital Content**
- **Data-Informed Decision-Making**
- **Parental Involvement/Communication**
- **Hardware for 21st Century Learning**
- **Arranging Technology for 21st Century Learning**
- **Beyond-school Access for 21st Century Learning**
- **Infrastructure for 21st Century Learning**
- **Technology Support for 21st Century Teaching and Learning**
- **Technology Literacy**

In order to gather this needed information for the Technology Department and the Georgia State Schools Superintendent, the Instructional Technology Division invited technology leaders from Georgia's 184 city and county public school districts to provide information on the current status of their local technology programs on the above topics in the Spring/Summer of 2006. Information was gathered through an interview protocol of 72 selected-choice and open-ended questions.

The protocol was administered to school district teams of technology leaders and their responses were recorded at a series of face-to-face meetings at each of the 13 Educational Technology Training Centers (ETTCs) in Georgia. After these meetings, the ETTC staff then recorded the school system responses in an online database. Participants represented 104/180 county and city school districts in Georgia. The following summary provides the number of respondents *(n)* for each individual item.

State-wide Survey Results by Subject

21st Century Instructional Practices

Items related to 21st Century instructional practices were designed to help answer the following:

1. How is technology being used to support learning in Georgia's schools?
2. To what extent are current instructional uses of technology focused on achieving the Georgia Performance Standards?
3. To what extent are educators satisfied with current technology-related instructional practice in Georgia's schools?
4. What are the greatest challenges to reaching higher levels of technology implementation in Georgia schools?
5. What strategies must be deployed in order to fully implement 21st Century instructional practices?

Data providing insight on each of these questions is provided below:

Types of Technology Use

To better understand what types of technology use are prevalent in Georgia schools, participating technology leaders were provided with seven descriptive categories of technology use in schools. Based on which categories a visitor to their school district would see most often in classrooms, participants were asked to rank the categories from (1) most frequent to (7) least frequent. Based on the response mean for each descriptive category, the table on the next page presents technology leaders' perceptions of technology use in Georgia schools from the most frequent to the least frequent. The table also includes the mode, the aggregated percentage of respondents answering 'frequent' (a one, two, or three on the scale), and the aggregated percentage of respondents answering 'infrequent' (a five, six, or seven on the scale).

Table 1.1

	Below are seven categories describing how technology might be used in K-12 schools. If a visitor was walking through schools in your school system, what types of instructional technology use would he/she most often see in your classrooms? Rank the categories from 1-7, 1 being the most frequent and 7 being the most infrequent.	n	Mean	Mode	% of respondents ranking in high frequency (1,2, or 3)	% of respondents ranking in low frequency (6, 7, or 8)
Most Frequent (1)	• Teachers using technology to present content to students or to stimulate teacher-led discussions. • Students using drill and practice software, games, and tutorials while teachers monitor their use and gauge their progress in mastering concepts • Students taking computer-based quizzes on the content of books they've read or lessons they've learned	100	2.37	1	80%	11%
	• Teachers dropping their students off at the lab to learn technology skills from another instructor • Teachers teaching their own students about technology, for example, how to use word processors, how to use spreadsheets, how to search on the Internet.	100	3.33	2	56%	21%
	• Students using the Internet or electronic databases to research information, access primary resources, and download graphics related to a topic of study • Students doing "web quests" • Students using software to draw geometric shapes • Students using spreadsheets to record and chart data from a science lab or a textbook activity • Students using software to write a research paper • Students using computer design software or drawing software to complete a project • Students using graphing calculators to solve problems or to complete a learning activity provided by the teacher • Students constructing a PowerPoint presentation to present to their class • Students participating in a computer-based simulation that encourages decision making and problem solving (such as Tom Snyder products, SimCity, SimEarth, etc.) • Students using technology to prepare materials for a mock trial or to document evidence found at a mock crime scene • Students recording nutritional information on what they've eaten in a spreadsheet • Students using probes to monitor their heart rate	99	3.40	5	55%	31%
	• Students using computer games, software, or the Internet as a reward after their "real work" is finished	103	4.11	5	35%	47%
	• Students using electronic instant response systems (such as e-Instruction CPS, Promethean active vote, Smartroom Beyond Question, Interwrite PRS, etc.) to answer teacher-generated questions • Teachers using computers to access formative assessment information on their students • Teachers reviewing electronic portfolios of student work • Teachers creating assessment items for an online assessment system • Students completing online assessments aligned to Georgia Performance Standards	98	4.19	4	37%	38%
	• Students creating, administering, and analyzing results from online surveys about current social issues. • Students participating in online projects which safely connect students to authentic learning experiences and to peers and mentors in other locations. • Students creating and posting podcasts on topics that are both relevant to Georgia Learning • Students generating questions/pursuing answers on standards-based learning topics that are of the most interest to them. • Students participating in web blogs for the purposes of learning • Students creating and publishing products that both demonstrate mastery of content and are of interest to an audience other than the students' teachers and immediate classmates. • Students learning marketing strategies and math skills by engaging in an actual online virtual business venture • Students posting their school newspaper stories online and engaging in conversations with other students across the country and around the world.	97	5.55	6	8%	86%
Least Frequent	• Teachers designing the instructional tools such as websites, databases, tutorials, simulations that they need for their classes • Students designing technological solutions to current problems and issues, for example, creating an interactive web-based database to help ESOL students understand local culture and language. • Students design a new type of scanner that optimizes 3-D graphics	104	6.04	7	7%	82%

Technology Use and Georgia Learning Standards

When asked about the relationship between student technology use in classrooms and learning standards, slightly more than half of the state's technology leaders (56%)

believed that student technology use is targeted toward achieving Georgia Performance Standards. Thirty-five percent of technology leaders believed that less than half of the student technology use in schools is targeted toward achieving state learning standards. Ten percent were undecided.

Table 1.2

What percentage of student technology use in your school system do you estimate is targeted toward achieving Georgia Learning Standards?	*Percentage of respondents in each category*
Less than 10%	7%
10-30%	12%
30-50%	16%
50-70%	17%
80-90%	28%
90-100%	11%
Not enough information to estimate	10%

Satisfaction with Technology Use

A majority of technology leaders (64%) indicated that they were moderately satisfied with the current level of technology use in their school districts. In accompanying comments, they explained that they were pleased that their school system had made progress, but they also acknowledged that there was more work to be done. Over one-third (34%) indicated that their system had made progress toward effective use of technology, but they also indicated that this progress was not enough to realize a positive effect on student achievement. Some technology leaders with low levels of satisfaction also cited significant barriers that prevented progress and, therefore, affected their satisfaction level. Only 2% of respondents indicated a high level of satisfaction.

Table 1.3

Which of the following best describes your satisfaction level related to instructional technology use in your school system?	*Percentage of respondents in each category*
Low - I am not very satisfied with our current uses of technology.	34%
Moderate - I am reasonably satisfied with our current uses of technology.	64%
High - I am very satisfied with our current uses of technology.	2%

Challenges to Effective Technology Use

Technology leaders were asked to select the greatest challenge to reaching higher levels of technology integration in their school system. The following table represents their responses, ranked in order from the most frequently selected challenge to the least selected. Their responses indicate that issues surrounding time and professional learning remain the most challenging barriers to effective technology use in classrooms. These data do not indicate that the other challenges are not a critical factor, however. Many respondents expressed difficulty in choosing among these challenges. Stable Internet access provided through the State and E-rate subsidized Network and local E-rate funding seems to be eliminating challenges related to Internet access. However, without those funding sources, Internet access might emerge as a challenge in the future.

Table 1.4

Which statement best represents the greatest challenge to reaching higher levels of technology integration in your school system?	*Percentage of respondents in each category*
Teachers lack time to integrate technology.	28%
Teachers lack skills necessary for effective technology integration.	26%
No school or system-level expectations for technology integration in the classroom.	13%
Lack of access to modern computers.	11%
Lack of access to software and other digital resources for learning.	5%
Inoperable computers.	1%
Limited or unreliable Internet Access.	0%
Other (lack of teacher buy-in, buy in from high-school teachers, priorities other than technology in schools/school districts, lack of funding for technology, lack of instructional technology support staff in each building to assist teachers with integration, no coordinated professional development program to follow In-Tech, resources expended to keep old equipment running, need for wireless networks, lack of vision for how technology can be used).	13%

Strategies for Improving Technology Implementation

When asked to select strategies that would help their school district achieve higher levels of technology supported instructional practices, participants again placed staffing, professional learning, time, and expectations as highest priorities. Perhaps since

the state network provides a strong statewide infrastructure, Internet access and bandwidth were the least selected strategies.

The following table represents the proposed strategies and the number/percentage of participants selecting each strategy:

Table 1.5

Proposed strategies to achieve higher levels of instructional technology use in schools	Number of participants selecting strategy (n=104)	Percentage of participants selecting strategy
1. Adding additional instructional technology facilitators to staff.	77	74.04%
2. Professional learning programs to improve teachers' technology integration skills.	75	72.12%
3. More time in the work schedule to integrate technology into learning.	72	69.23%
4. Stronger school or system-level expectations for technology integration in the classroom.	66	63.46%
5. Adding additional technical support staff.	58	55.77%
6. Better access to modern computers.	53	50.96%
7. Improving students' technology literacy skills so that they can use technology for learning.	46	44.23%
8. Better access to software and other digital resources for learning.	39	37.50%
9. Better access to other hardware.	37	35.58%
10. Improving technical support procedures and processes.	30	28.85%
11. More bandwidth.	25	24.04%
12. More stable Internet Access.	6	5.77%

Summary and Implications for Planning: 21st Century Instructional Practices

This data indicates that while some progress has been made in technology integration, the most desirable uses of technology—those most relevant to the instructional and curricular goals of the GaDOE—are still not realized in Georgia's schools (see table 1.1; 1.2). Barriers include lack of time to integrate technology, lack of skills for effective integration, and lack of expectations for technology-supported instruction. Participants also indicated a lack of vision, lack of professional development, and lack of "buy-in" as other constraining factors. In indicating barriers, participants consistently stressed the inadequacy of available human resources over technical factors such as inadequate access to computers, digital content, and the Internet—even though these also remain important to successful integration, as well (see Table 1.4).

In recommending strategies to the GaDOE, school system participants also showed preference for strategies that would improve human rather than technical access. For example, adding additional instructional technology facilitators, increasing professional learning programs, providing time for teachers to integrate technology, increasing expectations for effective technology use, and adding additional technology support staff outranked the need for greater connectivity or access to computers and software (see table 1. 5).

Digital Content

Since access to digital instructional resources is as important to the implementation of instructional technology as access to the Internet and computers, items in this section were developed to provide insight into the following:

1. *What types of instructional resources/digital content are currently being used in Georgia's classrooms?*
2. *How is digital content important to Georgia's instructional programs and practices?*
3. *How satisfied are technology leaders with the current use of digital content in Georgia's schools?*
4. *What challenges are currently hindering educators from acquiring digital content for instruction?*
5. *What strategies are currently being deployed to promote the use of standards-based digital content as an instructional resource?*
6. *What type of digital content will be available to Georgia schools in the next three years?*

Instructional Resources/Digital Content

Participants were provided with a list of eight types of instructional resources and asked to indicate the frequency of use for each resource type as (1) never; (2) rarely; (3) occasionally; (4) frequently; or (5) daily. The table below presents technology leaders' perceptions from the most frequently used instructional resource to the least

frequently used. The table also includes the mode, the aggregated percentage of respondents answering 'frequent' (a four or five on the scale), and the aggregated percentage of respondents answering 'infrequent' (a one or two on the scale).

All data analysis of the responses of participating technology leaders indicates that the print textbook and free WWW content may be the most frequently-used instructional resources in the state. Data also indicate that eBooks and teacher created digital content are the most infrequently used, even though there seems to be pockets of innovation in these areas. Nearly nine percent of participants indicated that teachers in their school districts frequently generate digital content and approximately 16% of school districts are frequently using eBooks.

Table 2.1

	Types of Instructional Resources	n	Mean	Mode	Frequent	Infrequent
Most Frequent ↑	1. Print textbooks and supporting print material	101	3.58	4	74.16%	12.36%
	2.Free WWW content	102	3.26	4	44.12%	15.69%
	3. Content specific software	99	2.79	3	21.43%	31.63%
↓ Least Frequent	4. Online periodical databases (such as GALILEO)	99	2.31	2	11.11%	59.60%
	5. Subscription-based WWW content	100	2.22	2	9.09%	60.61%
	6. Digital resources packaged with course Textbook	101	2.16	3	3.00%	61.00%
	7. Teacher created digital content	98	2.05	2	8.91%	70.30%
	8. eBooks	89	1.84	1	15.84%	78.22%

Importance of Digital Content

Participants were also asked to select reasons why digital content is important to their school system's instructional program. In general, participants were most attracted to the potential of digital content to appeal to students' individual needs and interests. Participants seemed less concerned with leading the transition to digital materials, supporting online learning initiatives, supporting environmentally-friendly practices, or shaping the evolution of online content. The following table presents the selected

statements in descending order of importance and the number/percentage of participants selecting each strategy:

Table 2.2

Why is digital content important to your school system's instructional program? (Select all that apply.)	*Percentage of respondents in each category n=102*
The multimedia nature of digital resources appeal to a broader variety of students' learning styles, allowing teachers to differentiate instruction.	80%
The immediacy of web-based digital resources has the potential to connect students to relevant, motivating, real-world learning experiences.	74%
Digital resources allow for dynamic visualizations/simulations that support learning and exploration.	66%
Digital resources can be more interactive than print resources. They can facilitate communication and collaboration in ways text resources cannot.	64%
Digital resources are presented in the format that 21st Century "digital" learners prefer and need. "Digital" is their "native language".	63%
Digital resources are more portable than print resources. They support "anywhere, anytime" learning.	61%
Digital content is more accessible since it can be archived, searched, and accessed on an "as-needed" basis.	59%
Collections of digital resources allow students to pursue their own learning interests, leading to learning that is more student-centered and generative.	58%
Locating, synthesizing and evaluating digital content supports students 21st Century literacy skills.	56%
Digital content facilitates parent and community involvement in children's education.	54%
Digital resources maximize the hardware available in schools. We need better access to digital resources to realize full implementation of instructional technology in schools.	54%
Digital resources are less expensive to produce than print resources.	53%
Digital resources can be updated more easily than text-based content. This should result in more timely, current information.	52%
Society is moving away from text based and toward digital content, so students not only need to be prepared for this shift, but to "lead" this shift.	49%
Digital resources are absolutely critical to online learning initiative.	48%
Digital resources are better for the environment.	39%
The school community currently has the opportunity to shape the development of digital content. As schools begin to emphasize digital content, education publishers will respond to their customers' needs.	29%

Satisfaction with Availability and Use of Digital Content

Slightly over half of participating technology leaders (54%) indicated that they were moderately satisfied with the current level of availability and use of digital content in their school districts. Yet, 38% indicated a low level of satisfaction. Only 8% of the school districts indicated high levels of satisfaction with current availability and use.

Table 2.3

Which of the following best describes your satisfaction level related to instructional technology use in their school system	*Percentage of respondents in each category*
Low - I am not very satisfied with our current availability and use of digital content.	38%
Moderate - I am reasonably satisfied with our current availability and use of digital content.	54%
High - I am very satisfied with our current availability and use of digital content.	8%

Barriers to Acquiring and Using Digital Content

Since nearly all participants (92%) indicated a low or moderate level of satisfaction, understanding the barriers to acquiring and using digital content in Georgia's school districts may be significant to future statewide planning. When asked to select the greatest challenge to reaching higher levels of technology integration in their school system, technology leaders' responses mirrored the same challenges associated with technology integration. Primary barriers centered on time, vision, professional learning, and staffing. However, participants also indicated that uncertainty about students' beyond school access also stifled the transition to digital-based instructional resources. The following table represents participants' responses, ranked in order from the most frequently selected challenge to the least selected.

Table 2.4

Which statement best represents the greatest challenge to reaching higher levels of technology integration in your school system?	*Percentage of respondents in each category n=102*
Teachers have little time to create, locate, and/or align digital content.	77%
Reluctance of school system personnel to shift from text-based to digital content.	65%
Teachers lack technical skills to create, locate, and/or align digital content.	61%
Lack of funds to purchase digital content.	61%
No personnel with role to create, locate and/or align digital content.	59%
Uncertainty about students' beyond-school access to Internet or modern computing devices makes teachers reluctant to rely on digital content for instruction.	52%
The personnel charged with creating, locating, and/or aligning digital content have little or no time to do so because of other job responsibilities that have higher priorities.	48%
No technical tools (databases, managed learning systems, etc.) are currently available to tag, post, and search digital content.	26%
Lack of reliable access to the Internet, adequate bandwidth, and/or to modern computing devices needed for students to use digital content during the school day.	24%
Poor availability of available digital content.	10%
Reluctance to share digital content outside the school system.	5%
Poor quality of available content.	5%
Other : Parents expect textbooks, security issues related to home access, fragmented purchasing plan for digital content.	2%

Current Strategies for Promoting the Use of Standards-based Digital Content

Participants were also asked to indicate what is currently being done in their school system to promote the use of digital content by choosing from a list of possible strategies. Their responses are listed from the most common strategy to the least common in the following table:

Table 2.5

Which strategies does your school system use to promote the use of standards-based digital content as instructional resources for teachers and students?	*Percentage of respondents in each category n=102*
Provides teachers and students with access to the Internet, which allows them to access free digital content on the WWW.	97%
Purchases content-based software for instructional use as needed and/or as funds are available.	79%
Provides teachers with training on how to use the productivity tools to create digital content.	61%
Purchases subscriptions to online digital content.	54%
Provides teachers with productivity tools to create digital content.	34%
Provides teachers with planning and preparation time to locate digital content and to integrate it into instruction.	34%
Requiring textbook purchases to be accompanied by digital content.	32%
Formally supports school system members in creating and/or locating digital content, aligning the content to learning standards, and sharing it with others via print or static electronic formats (Word documents, web pages, etc.).	29%
Employs personnel, such as instructional lead teachers or technology integration specialists, who are charged with creating and/or locating digital content and assisting teachers in integrating this content into the curriculum.	24%
Systematically forms review teams to evaluate and purchase digital content for all areas of the curriculum in much the same way textbooks have traditionally been selected and purchased.	17%
Not only supports school system members in creating and/or locating digital content, and aligning the content to learning standards, but promotes sharing by "tagging" digital content for inclusion in an online database or managed learning system that helps teachers.	11%
Collaborates with other schools and agencies to locate, create and share digital content via a searchable, web-based database of instructional resources.	9%
Purchases and uses eBooks as an alternative to printed texts.	7%

The Future of Digital Content

In an effort to predict the types of digital content that will emerge in Georgia school districts over the next three years, participants were asked to indicate what types of digital content they were planning to have available in their school districts. Data

suggests that school districts will continue to rely most heavily on resources that are free and low-cost (free WWW content, Georgia's virtual library - GALILEO, GaDOE/ETTC content, and content packaged with textbook purchases). These responses parallel participants' responses concerning what is currently used in schools. However, data may also indicate significant growth in other categories, as well. For example, prior data indicated that only 15% of school districts are using eBooks, but 43% of participants indicated interest in acquiring eBooks in the next three years. A full listing of participants' responses on the future of digital content is presented in the following table:

Table 2.6

In the next three years, which of the following types of digital content are you planning to have readily available and regularly used?	*Percentage of respondents in each category n=102*
Free WWW content/information	94%
GaDOE or ETTC content	80%
Digital resources packaged with course textbooks	76%
Content-specific software	75%
Subscription-based digital software	72%
Teacher-created digital content	68%
Online periodical databases	63%
Virtual School content	57%
e-Books	43%
Other (Assessments; resources developed by school-system personnel other than teachers)	1%

Summary and Implications for Planning: Digital Content

Even though educators recognize the importance of digital content (see table 2.2), most Georgia schools currently are expending a majority of their funds on print-based materials and using free web-based resources to supplement those materials (see Table 2.1). Challenges to moving from print-based to digital resources mirrored the same types of barriers associated with 21st Century learning practices (see Table 2.4). Factors preventing the shift to digital content include lack of time, lack of personnel, lack of skills, and lack of vision. Another factor may be that school districts are implementing only a limited number of strategies to increase the use of digital content (see Table 2.5).

Over half of districts are providing teachers with access to the Internet, software, online subscriptions, and training on how to create digital content, but fewer than half are providing teachers with preparation and planning time or support in creating and aligning digital resources. For example, only 24% of participants reported that their school system employs personnel such as instructional lead teachers or technology integration specialists, who are charged with creating and/or locating digital content and assisting teachers in integrating this content into the curriculum. Only 9% of respondents indicated that their school system collaborates with others to create and share content. In spite of the apparent lack of human resources and collaborative structures, most districts intend to increase the quantity and types of digital resources available for instruction in the next three years (see Table 2.6). For this reason, school districts are likely to need technical assistance in creating, archiving, evaluating, selecting, integrating, and sharing these resources.

Data-informed Decision Making

Since technology has great potential to contribute to data-informed decision making in schools, the protocol was also targeted the following questions:

1. How are Georgia educators currently using technology to enhance data-informed instructional decision-making?
2. How do Georgia educators plan to use technology to enhance data-informed, instructional decision-making in the next three-years?
3. How satisfied are Georgia educators with the current uses of technology for data-informed decision making?
4. What are the greatest challenges to using technology for data-informed decision making in Georgia schools?
5. What strategies are necessary to improve technology-supported, data-informed decision making in Georgia's schools?

Responses of technology leaders provide information on these questions in the following sections.

Current Uses of Technology for Data-informed Decision Making

Technology leaders' responses about their schools districts' practices surrounding technology-supported, data-informed decision-making are summarized in the table below. According to these data, 75% of school districts report having access to data analysis systems for state-mandated standardized tests, when in reality the Georgia Department of Education Data Warehouse, formerly known as the Georgia State Student Information System (GSSIS) project should be in place for 100% of school districts. Such a discrepancy may indicate that 25% of school districts are not fully aware of what their local SIS can provide for them or that the SIS is not fully functioning in their system. Furthermore, only 58%- 60% believe that their school districts are using data systems to share student information on state tests with teachers or to analyze that data to find trends and chart strategies to improve instruction. Less than half of the participants (40%-46%) believe that teachers use standardized test data to make instructional decisions, use formative assessment systems to frequently assess progress or collaborate with others to analyze data. Slightly over one-fourth of participants (27%) report the ability to use data to create an "intermediate snapshot" of student progress between annual administrations of standardized tests.

Table 3.1

Which of the following statements would best describe how educators are using technology to enhance data-informed, instructional decision-making in your school system?	*Percentage of respondents in each category n=102*
School system personnel have access to a data analysis system, which enables educators to analyze state-mandated standardized test data by demographic subgroups at the system and building levels.	75%
School system provides a data information system that allows teachers to review standardized test data for their students.	60%
School system personnel are actively using a data analysis system to analyze state-mandated standardized test data at the system and building level and to make instructional decisions for upcoming years.	58%
Teachers use data information systems to make instructional decisions about their students based on state-mandated standardized tests.	46%
Teachers have access to formative assessment systems that allow them to frequently assess student progress toward achieving state performance standards.	46%
Teachers collaborate with other educators to review classroom assessment data and make instructional decisions.	40%
The school system designs and implements classroom-based formative assessment programs to create an "intermediate snapshot" of student progress between state-mandated assessments.	27%

Future Uses of Technology to Support Data-informed Decision Making

By choosing from a list of possible actions, participants also indicated how their school system was planning to use technology to enhance technology-supported, data-informed decision making in the future. Findings suggest that a vast majority of school districts are planning to increase the use of the Georgia Department of Education Data warehouse or other data analysis systems to analyze standardized tests and to enact that data for school improvement purposes. Data also suggest that most school districts (65%-71%) are planning to enable more teachers to engage in data-informed decision-making about instruction by providing greater access to state test data and formative evaluation tools. Slightly less than one-third (31%) are even pressing for electronic portfolio systems. Participants' responses are more fully summarized in the following table:

Table 3.2

How do you plan to use technology for data-informed instructional decision making within the next three years?	*Percentage of respondents in each category n=102*
To analyze state-mandated standardized test data by demographic subgroups at the system and building-levels and to make instructional decisions for upcoming years.	90%
To enable teachers to make instructional decisions about their students based on state-mandated standardized tests.	82%
To enable teachers to conduct formative assessment of student progress toward achieving state learning standards at the classroom level so that they can make more immediate instructional modifications.	71%
To structure and report classroom-based, formative evaluation data so that progress toward standards can be monitored more frequently and educators can make collective decisions about instruction.	65%
To use e-portfolios to assess students' progress toward meeting learning standards.	30%

Satisfaction with Use of Technology to Enhance Data-informed Decision Making

Slightly over half of participating technology leaders (62%) indicated that they were moderately satisfied with the current use of technology to enhance data-informed decision making; while 30% indicated a low level of satisfaction. Only 8% of the school

districts indicated high levels of satisfaction with technology-supported data practices.

Table 3.3

Which of the following best describes your satisfaction level concerning the current use of technology to enhance data-informed, instructional decision making in your school system?	*Percentage of respondents in each category*
Low - I am not very satisfied with our current uses of technology for data-informed decision making.	30%
Moderate – I am reasonably satisfied with our current uses of technology for data-informed instructional decision making.	62%
High - I am very satisfied with our current uses of technology for data-informed decision making. We have many exemplary practices.	8%

Challenges to Using Technology for Data-informed Decision Making

When choosing from a list of possible constraints to technology-supported data-driven decision making, participants indicated that improving the assessment literacy among educators was the greatest need in their school districts. Other barriers and the percentage of technology leaders who selected each barrier are summarized in the following table:

Table 3.4

What are your school system's current challenges in using technology to enhance data-informed, instructional decision making? (Select all that apply.)	*Percentage of respondents in each category n=102*
We need more training to fully utilize Cognos.	64%
Many educators need to improve their "assessment literacy" in order to maximize technology tools for data analysis.	62%
Data from state-mandated tests are returned too slowly to inform instruction.	39%
Cognos is not functional in our school system.	38%
Many educators do not possess the basic technical skills necessary to operate assessment systems.	34%
We don't have formative assessment systems or programs in place at the classroom level.	28%
We don't know how to implement formative assessment systems or programs at the classroom level.	13%
There are limited licenses to Cognos.	13%
We fear that classroom level assessment systems will have negative effect on instruction (i.e. too much testing, interfering with teachers' instructional practices/autonomy in the classroom, impeding project-based instruction, or too much focus on lower-level cognitive skills.	10%
We don't have interest in placing formative assessment systems in place at the classroom level.	3%
Cognos does not meet our needs.	2%
We lack the technology (hardware, infrastructure) necessary to implement assessment systems at the system and/or school level.	0%
Other	0%

Necessary Strategies for Improving Technology-supported Data Practices

When asked what strategies would be necessary to improve technology-supported data collection and analysis practices in their school districts, technology leaders most often indicated the need for professional learning (74%). This result is consistent with participants' claims that improving assessment literacy was the greatest barrier to enhancing data practices in their school districts. Nearly half of all participants also indicated the need to construct a data collection plan (49%) and to research the effective use of technology-based assessment programs in other locations (48%). Forty-one percent of respondents indicated the need to purchase additional assessment systems and 28% indicated that their districts intended to engage in some level of local development. The following table provides a summary of these results:

Table 3.5

What strategies must be deployed in order to improve data-informed, instructional decision-making in your school system? (Select all that apply.)	*Percentage of respondents in each category n=102*
Offering professional learning opportunities for educators in formative assessment/data-informed decision making.	74%
Constructing a system-level plan for technology-enhanced assessment/data-informed decision making.	49%
Researching models of effective use of technology-based assessment systems/data-informed decision making in other locations.	48%
Purchase of assessment systems.	41%
Local development of assessment systems.	28%
Other: Creating teacher data teams; developing benchmark assessments.	2%

Summary and Implications for Planning: Data-informed Decision Making

Reports from participants indicate that best practices in data-informed decision making are still at early stages of development. Since only 58%-75% indicated that data is being analyzed and used in various ways at the system level, there is still a high need for technical support for the most basic types of data-related best practices. Data practices at the school and classroom level were even less common. In fact, less than half of participants reported teacher decision-making based on data and formative assessment

practices at the classroom level (see Table 3.1). Again mirroring prior sections, barriers to more effective use centered on a lack of knowledge and skills (Table 3. 4.) and recommended strategies focused on professional learning (see Table 3.5).

The Georgia Department of Education Data Warehouse has been designed to be an integrated, historical database. The GaDOE Data Warehouse was created using data from the 2005-2006 school year and it will continue to be fed with each school year's data. Users can perform analyses at the state, district, school, and student level to inform and benefit their school improvement efforts. Incorporated with this data warehouse is a powerful business intelligence tool that creates the reports accessed through the GaDOE secure Portal. This business intelligence tool may be used in future releases of data to create ad hoc reports for analysis of students' progress over time.

Parental Involvement/Communication

The No Child Left Behind Law (NCLB) stresses the importance of involving parents in their children's education, and technology, again, can contribute to this effort. Therefore, protocol items were created to gather information related to the following questions:

1. *What technology-related practices are currently being implemented to support parental involvement and communication?*
2. *To what extent are Georgia's technology leaders currently satisfied with their school system's use of technology to support parent involvement and communication?*
3. *What current challenges impede Georgia's school districts from using technology to advance parent involvement and communication?*
4. *What technology-related strategies are necessary to strengthen home/school connections in Georgia's school system?*

The following sections provide insight into answering each of these questions.

Current Uses of Technology for Parental Involvement and Communication

To determine which types of technology-supported strategies are being used to support parental involvement and communication in Georgia's schools, technology leaders were asked to select practices that were currently "pervasive" in their school system. According to responses of participants, the most common, pervasive, technology-related practices for parent communication and involvement are (1) posting critical information on school websites (59%); (2) making teachers' email addresses available to parents (54%); and (3) posting student grades online (42%). Some school districts also routinely post students' attendance (29%); schedules (19%); and homework (19%) online. In addition, 13% of school districts regularly use technology to seek parent feedback during strategic planning. Three percent of school districts provide parents and students with online registration. Two percent use blogs to communicate with parents and less than one percent use podcasts. These findings are also represented in the following table:

Table 4.1

Which of the following statements best describe practices that are pervasive in your school system for communicating with parents and involving parents in their children's education? (Select all that apply.)	*Percentage of respondents in each category n=102*
Posts critical information on school website.	59%
Makes teachers' email addresses available and encourages parent-teacher communication.	54%
Posts students' grades online.	42%
Posts students' attendance online.	29%
Posts students' schedules online.	19%
Posts students' homework online.	19%
Seeks online feedback from parents during strategic planning activities.	13%
Provides students/parents with online registration/scheduling options.	3%
Uses blogs to communicate with parents.	2%
Uses podcasts to communicate with parents.	1%
Other: Call-back systems; automatic email bulletins for parent subscribers; push phone calls; local cable channels; school technology nights; posts school menus.	5%

Satisfaction with Use of Technology to Enhance Parent Communication/ Involvement

Forty-six percent of technology leaders expressed low levels of satisfaction with current uses of technology for parent/school communication efforts, and this response represents a higher percentage in the "low satisfaction" than any other subsection of the protocol. Thirty-nine percent categorized their satisfaction level as moderate and 15% as high.

Table 4.2

Which of the following best describes your satisfaction level concerning your schools system's current use of technology to communicate with parents and to involve parents in their children's education?	*Percentage of respondents in each category*
Low - I am not very satisfied with our current uses of technology for parent/school communication/involvement.	46%
Moderate – I am reasonably satisfied with our current uses of technology for parent/school communication/involvement.	39%
High - I am very satisfied with our current uses of technology for parent/school communication/involvement. We have many exemplary practices.	15%

Challenges to Using Technology for Parent Communication and Involvement

When choosing from a list of possible barriers to computer mediated home-school communication, over half of the participants indicated human resource barriers including teacher time (59%); limited staff to manage online communication (59%); and lack of web development expertise to create online communication environments (52%). Over half (51%) also indicated parents may not have the home access or the technical skills necessary to benefit from technology-supported communication and involvement methods. Lack of funds (39%); lack of educator interest (39%) and lack of parent interest (29%) were also thought to hinder technology-related home-school connections in Georgia's school districts. Other barriers included lack of infrastructure, security concerns, and lack of teacher skills to construct and engage in online communication.

Table 4.3

What are your school system's current challenges in using technology to support parent communication and involvement? (Select all that apply.)	*Percentage of respondents in each category n=102*
Lack of teacher time to input information/respond to parents.	61%
Lack of staff to manage online communication systems.	59%
Lack of web development expertise to produce interactive web sites, blogs, podcasts, etc.	52%
A real or perceived lack of parents' current access to technologies and/or technology skills needed to engage in technology-supported communication/involvement.	51%
Lack of funds to purchase or develop online communication systems.	39%
Lack of educator interest in providing online communication.	39%
A lack of parent interest in using technology to communicate with school.	29%
Lack of infrastructure and hardware needs to provide online services for parent-school communication/involvement.	11%
Others: Security of student data; lack of teacher skills to construct and engage in online communication environments.	5%

Future Strategies for Using Technology for Parent Communication/Involvement

To determine future directions for Georgia's schools, participants were asked to choose which technology-related strategies would be deployed within the next three years to improve home-school connections in their school districts. The following table summarizes the percentage of participants who project that their district will use each strategy. When compared with Table 4.1, which reports current levels of technology use in many of the same categories, these data suggest that Georgia school districts will be expanding many computer-mediated communication techniques to strengthen home-school communication and the most pervasive strategies may shift somewhat as well. Using the world wide web will most likely remain as the primary strategy to communicate with parents, with 70% of districts striving to have regularly updated teacher web pages.

School districts also have the desire to develop more targeted and specific ways to share student information (such as homework assignments, schedules, attendance, and grades) with parents and to gather online feedback from parents. While new technologies

such as blogs and podcasting may remain the most infrequently used strategies for school-home communication, the data suggest that these technologies will still proliferate at a rate of 22-27%. The only strategy declining in both rank and percentage is relying on email exchange between teacher and parent. While this will remain an important strategy for home school communication, the data suggest that other strategies will surpass this type of interaction. This decline might be explained by school districts' efforts to reduce challenges on teachers' time by finding more efficient, structured, systematic ways to share routine information with parents.

Table 4.4

Which of the following statements best describe strategies that will become pervasive in your school system during the next three years for communicating with parents and involving parents in their children's education? (Select all that apply.)	*Percentage of respondents in each category n=102*	*Difference from current practice*	*Ranking projected, pervasive strategies (w/in 3 yrs.)*	*Ranking in current, pervasive strategies*
All teachers having web pages that are updated regularly.	70%	NA	NA	NA
Improve school website/Post critical info on school website.	58%	+1%	1	1
Posts students' homework online.	56%	+37%	2	6
Posts students' grades online.	53%	+12%	3	3
Posts students' attendance online.	53%	+24%	4	4
Seeks online feedback from parents during strategic planning activities.	53%	+40%	5	7
Posts students' schedules online.	51%	+32%	6	5
Makes teachers' email addresses available and encourages parent-teacher communication.	43%	-9%	7	2
Provides students/parents with online registration/scheduling options.	39%	+10%	8	8
Uses blogs to communicate with parents.	29%	+27%	9	9
Uses podcasts to communicate with parents.	23%	+22%	10	10

Summary and Implications for Planning: Parent Involvement

Responses of participants indicate that schools are very limited in the ways they currently use technology to communicate with parents. Data also indicate that these current methods are also among the most time consuming and demanding (see Table 4.3). Data also suggests that school districts have the desire to incorporate other types of communication models (see Table 4.4), but to move forward, they will need support in

selecting and implementing more efficient ways of providing information to parents (see Tables 4.4).

Hardware for 21st Century Learning

Items in this section were developed to answer the following questions:

1. *What types of technologies are needed to support 21st Century learning in Georgia's classrooms?*
2. *To what extent are Georgia educators currently satisfied with their current access to technology to support 21st Century learning?*
3. *What current hardware needs must be addressed in order to fully implement 21st Century learning in your school system?*

Note: the current status of hardware for 21st Century learning can be obtained from the GaDOE annual technology inventory. (http://www.gadoe.org/it.aspx?PageReq=ITInventory)

Technology for Classrooms and Schools

During the data collection meetings, technology leadership teams were asked to generate equipment lists that would best support 21st Century learning in classrooms. Sixty-seven responses were recorded. Modern, Internet-connected computing devices for teachers and students were mentioned in all lists (100%). Most groups also suggested that teachers have their own computers (60%) and many suggested that those teacher computers be laptops (40%). Nearly half (43%) explicitly recommended 1:1 ratios of student computing devices, while others (15%) recommended either a 5:1 or a 3:1 ratio. Forty-two percent made no explicit recommendations for student to computer ratios. Second only to modern computers, LCD projectors were mentioned in 69% of equipment lists. They were followed by interactive whiteboard or interactive slates (60%) and student response systems (30%). Other items mentioned in many equipment lists included printers, scanners, audio/visual/multimedia equipment, graphing calculators, science probes, phones, handhelds, and MP3 players. A table representing participants'

responses follows. Italicized items are considered to be subsets of the category that precedes it.

Table 5.1

What kinds of hardware should be available in classrooms to support 21st Century learning? (record as many items as apply)	*Percentage of respondents in each category n=67*
Modern internet connected computing devices for teachers and students	100%
Teacher computers	60%
Teacher laptops	40%
1:1 ratios of student computing devices	43%
5:1 to 3:1 ratios of students to computers	15%
Interactive whiteboards and/or slates	60%
LCD projectors	54%
Mounted LCD projectors	*15%*
Student response systems	30%
AV/Multimedia equipment (cameras, TVs, DVDs)	19%
Science probes	15%
Graphing calculators	13%
Scanners	12%
MP3 players	4%
Phones	1%

Satisfaction with Current Access to Hardware

Once again, participants were asked to categorize their satisfaction related to current access to hardware for 21st Century learning in their school system. Slightly over half (54%) indicated a moderate level and slightly over one-third (34%) expressed a low level of satisfaction with amount of available hardware. A small minority (12%) expressed high levels of satisfaction. Participants explained that their moderate and low satisfaction levels hinged on the following: (1) difficulty in keeping up with necessary refresh cycles; (2) challenges in upgrading aging equipment; (3) barriers to acquiring funds for interactive whiteboards and other equipment additions; (4) the need and/or desire to move to 1:1 computing; and (5) inequity among school sites.

Table 5.2

To what extent are you satisfied with the amount of hardware available to educators and students your school system?	*Percentage of respondents in each category*
Low - I am not at all satisfied with the amount of hardware available.	34%
Moderate – Moderate-I am somewhat satisfied with the amount of hardware available.	54%
High - High - I am very satisfied with the amount of hardware available.	12%

Current Hardware Needs

In order to assess the technology access gaps in Georgia schools, participants selected items that represented their school districts' local technology needs. Mounted projectors topped the list (94%) followed by the need for interactive whiteboards (86%), for newer student desktops (72%), and for student response systems (71%). A complete listing of reported hardware needs from the most to least pressing is provided in the following table:

Table 5.3

Which hardware access needs exist in your school system? (Select all that apply.)	*Percentage of respondents in each category n=102*
Need for mounted projectors in classrooms.	94%
Need for interactive whiteboards.	86%
Need to refresh aging student desktop computers in classrooms.	72%
Need for student instant response systems.	71%
Need for peripheral computing devices, such as handhelds, probes, graphing calculators, GPS, GIS, etc.	66%
Need to upgrade or obtain wireless access points.	65%
Need to upgrade aging teacher desktop/laptop computers.	60%
Need to purchase laptops for students so we can move toward 1:1 computing in our schools.	60%
Need to upgrade aging student desktop computers in labs.	57%
Need administrative laptops.	53%
Need to upgrade or purchase other network equipment.	52%
Need to locate an inexpensive, mobile alternative to current laptops on the market so we can move to 1:1 computing in our schools.	50%
Need for networked printers in classrooms.	49%
Need administrative handheld devices.	43%
Others	0%

Summary and Implications for Planning: 21st Century Hardware

While other sections have highlighted the need for professional learning to support skill development and conceptual change, this section highlights that the basic need for hardware is still strong in local districts. This section also highlights the interest of school districts in 1:1 computing environments and interactive whiteboards. Future planning initiatives might take into account these system-level needs.

Arranging Instructional Computers for 21st Century Learning

Since 21st Century learning requires educators to rethink nearly every aspect of learning environments, this section explores how school districts are arranging instructional computing devices. Questions addressed in this section include:

1. *How are school districts currently arranging instructional computers?*
2. *To what extent are Georgia educators satisfied with current arrangement of instructional computers?*
3. *What are the strengths and weaknesses of various arrangement models?*
4. *How are school districts planning to arrange instructional computers in the future?*
5. *What challenges may prevent school districts from achieving desired arrangement plans?*

Current Technology Arrangements

Technology leaders reported that desktop computers in labs (100%) and desktop computers in classrooms (98%) remain the most common configuration of computers in schools. Seventy-five percent also reported the use of mobile laptop labs in their schools. Only 16% are reportedly implementing 1:1 computing environments where laptops are assigned to individual students.

Table 6.1

How are instructional computers arranged in your school system? (Select all that apply.)	*Percentage of respondents in each category n=100*
Desktop computers in labs	100%
Desktop computers in classrooms	98%
Mobile laptop labs	75%
Laptops assigned to individual students to create 1:1 computing environments	16%
Other	0%

Of these four configuration models, desktop computers in labs (45%) and desktop computers in classrooms (44%) remained the primary methods of arranging technology in schools. Only 11% of participants reported that their school system relied on mobile

laptops as the predominant arrangement. No one claimed 1:1 laptops initiatives as their system's primary arrangement method.

Table 6.2

What is the primary method of arranging instructional computers in your school system? (Select only one.)	*Percentage of respondents in each category n=100*
Desktop computers in labs	45%
Desktop computers in classrooms	44%
Mobile laptop labs	11%
Laptops assigned to individual students to create 1:1 computing environments	0%
Other	0%

Satisfaction with Current Technology Arrangements

Next, participants were asked to consider the extent to which they are satisfied with current configurations of instructional computers. In forming an answer, they were asked to consider a broad spectrum of issues including teacher and student satisfaction levels, maintenance needs, classroom management issues, and set up time in their assessment. A majority of respondents chose "moderate" (74%). Sixteen percent chose "low" and ten percent chose "high."

Table 6.3

To what extent are you satisfied with the current arrangement of instructional computers in your school system?	*Percentage of respondents in each category*
Low- Current arrangements are not very successful in our school system as they do not fully support 21st Century learning needs and/or effective classroom management.	16%
Moderate – Current arrangements meet some 21st Century learning needs and/or effective classroom management, but there is room for improvement.	74%
High – Current arrangements optimize 21st Century learning and classroom management.	10%

Strengths and Weaknesses of Arrangement Models

In addition to ranking current satisfaction with current arrangements, participating technology leaders were also asked to record strength and weaknesses for each configuration model. Their responses were analyzed, synthesized to avoid redundancy, and reworded for clarity. A summary of their edited responses follows:

Table 6.4

Arrangement	Strengths	Weaknesses
Desktops in Computer Labs	a. Desktops are more reliable and durable than laptops. b. Desktops, larger monitors, and mice are better suited to some tasks and users than laptops. c. Desktops are cheaper than laptops. d. Desktops are usually networked with wired connections, which are faster and more reliable than wireless. e. It is easier to maintain technology in a central location such as a lab. f. It is easier to secure technology from theft and misuse. g. Arrangement provides 1:1 access for instruction. h. Arrangement provides optimum environment for testing, demonstration, and skills training. i. Labs can double as teacher training centers beyond school hours.	a. If lab monitor or computer teacher is available, teachers tend to "drop off" students for drill and practice or technology skill instruction which may or may not be linked to content standards. b. Teachers have limited access to the labs. c. Scheduling can be time-consuming, unorganized, and conflict-ridden. d. Advanced scheduling reduces ability to pursue short-term learning goals as they emerge. e. Labs require physical space and many schools are already over-crowded. f. Obtaining enough labs to meet daily instructional needs of teachers/ students is impossible. g. Travel to and from class wastes instructional time. h. Furniture for desktops is expensive. i. Labs are usually fixed arrangements that can not easily be modified for different types of instructional tasks. For example, traditional lab arrangements may not be conducive to peer-to-peer conversation and collaborative learning. j. Arrangement does not provide for student with 24/7 access to a personal computing device.
Desktops in Classrooms	a. Desktops are more reliable and durable than laptops. b. Desktops, larger monitors, and mice are better suited to some tasks and users than laptops. c. Desktops are cheaper than laptops. d. Desktops are usually networked with wired connections, which are faster and more reliable than wireless. e. The presence of desktops in classrooms encourages integration into content, standards and daily classroom practice. f. Students/teachers do not have to waste instructional time walking to labs.	a. No teacher uses computers during every learning experience so computers can sit idle in classrooms, even in the best of circumstances. b. There are usually not enough desktops in classrooms to accommodate either small-group or full-class instruction. c. Computers are usually not arranged effectively for small group work. Students have to "visit" the computer. d. Classrooms are too small to arrange desktops for effective instruction. e. Too few desktops and poor arrangements cause classroom management issues. f. Desktops arrangements in classrooms often impede teachers' ability to rearrange the room for different instructional tasks (such as testing, for example). g. Furniture for desktops is expensive. h. Wiring classrooms is more expensive than wireless. i. Wire management (power, network, mouse, keyboard) is awkward in small classroom spaces and may cause safety hazards. j. Arrangement does not provide for student with 24/7 access to a personal computing device.

Arrangement	Strengths	Weaknesses
Mobile, Wireless Laptop Labs	a. Provides 1:1 student-to-computer access. b. Wireless and battery-powered computing devices allow for flexible arrangement of computers in classrooms. c. Laptops ease classroom space requirements and additional furniture needed for desktops. d. Wireless networking is cheaper than establishing wired connections. e. Mobile labs are portable and can be moved from classroom to classroom according to instructional needs; thus minimizing down time or idle computers.	a. Batteries must be charged and will not last the entire instructional day. Extra batteries or charging procedures must be in place. b. Laptops are more fragile than desktops. c. Laptops are more difficult to secure than desktops. d. Laptops are more expensive than desktops. e. Starting up laptops and connecting them to the wireless network often creates more technical problems than wired desktops, which places more technical support demands on the teacher. f. Wireless connections are slower than wired connections. g. Wireless connections cannot support all types of uses, such as video streaming and database management. h. Wireless networks are more difficult to maintain and secure than wired connections. i. School staff members often lack the technical expertise to manage wireless connections. j. Finding storage space for laptop carts in crowded schools is difficult. k. Arrangement does not provide student with 24/7 access to a personal computing device. l. Wireless laptop labs must be scheduled in the same way as physical labs. m. Depending on the number of available labs, access for instruction still may be inadequate. n. Carts containing laptops are heavy and difficult to move from room to room. o. Wireless laptop labs are more difficult to maintain than wired labs with desktops. p. Set up and tear down time reduces instructional time. q. Students must share instructional computing devices and store work on portable media.
Laptop Cart permanently assigned to each classroom	a. Provides 1:1 student-to-computer access. b. Wireless and battery-powered computing devices allow for flexible arrangement of computers in classrooms. c. Laptops ease classroom space requirements and additional furniture needed for desktops. d. Wireless networking is cheaper than establishing wired connections. e. Assigning a classroom set of laptops to each room eliminates loss of instructional time. f. Permanently assigning laptops eliminates scheduling issues and allows teachers. more flexibility in planning for and using technology for instruction. g. Restricting use of laptop cart to only one classroom may help reduce technical issues.	a. Batteries must be charged and will not last the entire instructional day. Extra batteries or charging procedures must be in place. b. Laptops are more fragile than desktops. c. Laptops are more difficult to secure than desktops. d. Laptops are more expensive than desktops. e. Starting up laptops and connecting them to the wireless network often creates more technical problems than wired desktops, which places more technical support demands on the teacher. f. Wireless connections are slower than wired connections. g. Wireless connections cannot support all types of uses, such as video streaming and database management. h. Wireless networks are more difficult to maintain and secure than wired connections. i. School staff members often lack the technical expertise to manage wireless connections. j. Finding storage space for laptop carts in crowded schools is difficult.

Arrangement	Strengths	Weaknesses
		k. Arrangement does not provide student with 24/7 access to a personal computing device. l. Providing a laptop cart in each classroom requires significantly more computers and, therefore, is more expensive than fixed, desktop labs or desktops in classrooms.
1:1 laptop initiatives*	a. Provides 1:1 student-to-computer access. b. Wireless and battery-powered computing devices allow for flexible arrangement of computers in classrooms. c. Laptops ease classroom space requirements and additional furniture needed for desktops. d. Wireless networking is cheaper than establishing wired connections. e. Assigning a classroom set of laptops to each room eliminates loss of instructional time. f. Permanently assigning laptops eliminates scheduling issues and allows teachers. more flexibility in planning for and using technology for instruction. g. Arrangement providing student with 24/7 access to a personal computing device may improve students' technology literacy and student achievement in ways other arrangements can not. h. Arrangement reduces digital divide by providing students with equitable access to computing device. i. Assigning a laptop to each student may further minimize loss of instructional time and eliminates scheduling issues. f. May reduce set up and tear down time associated with wireless/laptop lab and classroom models. g. Exerts the greatest social pressure on teachers to use technology to enrich daily instructional practices.	a. Batteries must be charged and will not last the entire instructional day. Extra batteries or charging procedures must be in place. b. Laptops are more fragile than desktops. c. Laptops are more difficult to secure than desktops. d. Laptops are more expensive than desktops. e. Starting up laptops and connecting them to the wireless network often creates more technical problems than wired desktops, which places more technical support demands on the teacher. f. Wireless connections are slower than wired connections. g. Wireless connections cannot support all types of uses, such as video streaming and database management. h. Wireless networks are more difficult to maintain and secure than wired connections. i. School staff members often lack the technical expertise to manage wireless connections j. Assigning laptops to individual students for use at both home and school increases maintenance needs; software costs; and the risk of viruses/damage/theft. k. Lack of models on how to fund additional software, maintenance, repair, and replacement costs associated with 1:1. l. Updating operating systems and applications requires new technical support models. m. 1:1 initiatives may only be appropriate for older students (middle school and up). n. Home access increases educators' and parents' concerns over inappropriate use and Internet safety. o. Arrangement does not provide for students' home access, and home access is critical to maximize the potential and justify the cost of 1:1 initiatives. p. Individual user questions may be overwhelming to the teacher. q. Pressure to use technology to enrich daily instructional practices may be overwhelming to teachers. r. 1:1 initiatives represent the highest cost to school districts of any other arrangement model. s. 1:1 initiatives potentially involve cost to parents, as well.
**1:1 laptop initiatives assign laptop computers to each individual student. The laptop travels with the student throughout the instructional day. Most 1:1 initiatives allow students to take the laptop home with them, but a few programs mandate that the laptops are stored on school premises overnight and on weekends. This discussion of 1:1 initiatives assumes that students have access to their computing device 24/7.*		

Future Arrangement Plans

When asked about how their school system plans to arrange instructional computers in the next three years, participants indicated a shift away from desktops in labs and classrooms and toward mobile labs as the primary configuration model. Responses also predict a slight increase in 1:1 initiatives in the next three years. The following table represents technology leaders' perceptions of how computers will be arranged during the next three years and compares these projections to current configurations.

Table 6.4

What will be the primary method of arranging instructional computers in your school system during the next three years? (Select only one.)	*Percentage of respondents in each category n=90*	*Percentage of respondents in each category for "Current primary method" n=100*
Desktop computers in labs	24% (-21%)	45%
Desktop computers in classrooms	31% (-13%)	44%
Mobile laptop labs	37% (+26%)	11%
Laptops assigned to individual students to create 1:1 computing environments	8% (+8%)	0%
Other	0%	0%

Challenges to Future Arrangement Plans

In order to assess threats to system-level plans to achieve desired configuration models, participants were asked to select items from a list of potential barriers that might hinder progress. Securing the financial resources to refresh existing computers (86%) and to buy initial equipment (84%) emerged as the greatest challenges toward new arrangement models. Lack of technical support (46%) and teacher preparation to implement a technology-rich curriculum (42%) ranked third and fourth among school system concerns as represented by participants. Student beyond-school access (25%) and fear that students would damage computers (22%) also emerged as potential barriers for

many school districts. Responses of participants concerning possible barriers to achieving desired arrangement models are summarized in the following table:

Table 6.5

What barriers, if any, might hinder your school system from achieving planned arrangement models in the next three years? (Select all that apply.)	*Percentage of respondents in each category n=102*
Lack of available funding to refresh over time.	**86%**
Lack of available funding for initial purchases.	**84%**
Lack of technical support to maintain it	46%
Teachers not prepared to implement technology-rich curricula.	42%
Students' lack of high-speed access to the Internet after school hours.	**25%**
Fear that students will damage computers.	**22%**
Lack of teacher support.	14%
Lack of access to digital content and/or productivity tools that would help students fully maximize use of the computers.	13%
Concern over access to inappropriate material.	13%
Setting up or accessing technology takes up too much time in class.	11%
Existing school network cannot support it	7%
Concern over student safety.	6%
Lack of community support	5%
Too much technology will disrupt educational process.	2%

Summary and Implications for Planning: Arranging Instructional Computers

In the previous section on hardware, school system representatives exhibited a strong desire to see 1:1 computing realized in classrooms. Yet, this section shows that no system is relying on 1:1 arrangements as their primary technology access strategy and only 16% are implementing 1:1 arrangements in some form (see Tables 6.1; 6.2). The future of 1:1 implementations is also limited in the next three years. Table 6.4 shows that there will be an additional 26% who rely on mobile labs for their primary arrangement model; however, 1:1 configurations will increase by only 8%. The high desire for 1:1 configurations paired with this slower proliferation rate indicates that the current barriers likely are constraining districts from full adoption. To move toward 1:1 arrangements, districts will need models which address funding and implementation barriers represented in Table 6.5.

Beyond-school Access for 21st Century Learning

Beyond-school access is likely to affect instructional practices, the future of 1:1 initiatives, and parent-school communication/involvement. Yet, concrete data concerning home and beyond-school access is difficult to obtain and analyze. For these reasons, this section of the state planning protocol includes several items to address the following questions:

1. *What percentage of students/parents in Georgia has home access to a modern, Internet-connected computer?*
2. *What are the greatest barriers that hinder Georgia's students/parents from acquiring home access?*
3. *What percentage of Georgia's students/parents has access to a modern, Internet-connected computer through public access sites or another location?*
4. *What is the relationship between beyond-school access to Internet-connected, modern computers and instructional practices in Georgia's schools?*
5. *What strategies are Georgia's school districts using to promote beyond-school access to Internet-connected, modern computers for parents and students?*

Current Home Access Levels

Data collected on current beyond-school access levels suggests that many students still do not have access to Internet-connected, modern computers in their homes. For example, 55% of participants estimated that fewer than half of their students have home access. Thirty-five percent of participants reported that over half of their students have home access, and 11% of participants did not have enough information to provide an estimate. Since only 26% of participants based their responses on actual data collection in their school system or community, the accuracy of participants' reports and the current levels of beyond-school access are still relatively unknown. A full summary of participants' responses is provided in the following tables:

Table 7.1

What percentage of students in your school system do you estimate to have home access to an Internet-connected, modern computer? (Select one.)	*Percentage of respondents in each category n=101*
Less than 10% of students have access.	**5%**
Between 11-30% have access.	**16%**
Between 31%-50% have access.	34%
Between 51%-70% have access.	25%
Between 71%-90% have access.	**9%**
Between 90%-100% have access.	**1%**
I don't have enough information to estimate.	11%

Table 7.2

Is this estimate based on actual data collection? (Select one.)	*Percentage of respondents in each category n=93*
Yes	**26%**
No	**74%**

Barriers to Home Access

Since home access levels are lower than desired for 21st Century teaching and learning, it is important to understand the barriers that block full proliferation of Internet access and modern computing in the home. Overwhelmingly, participants believe that the main reason that students do not have home access is that their parents lack the financial resources to purchase computers and/or to pay Internet access fees (93%). Other reasons for lack of home access include failure to see the need for home access (31%), concerns over student access to inappropriate material (31%), and concerns for student safety on the Internet (29%). Lack of affordable high-speed Internet connectivity options is thought to plague 26% of families. For others there are only dial-up connections (16%). For the very few, there are no high-speed options available (6%), dial-up options in the area are still relatively expensive (6%), and there are absolutely no dial-up or high-speed Internet access options available to consumers in some areas of the state (4%). The following table presents participants' perceived barriers to home access from the most commonly to the least commonly cited:

Table 7.3

What current barriers hinder students in your school system from acquiring home access to the modern, Internet-connected computers? (Select as many as apply.)	*Percentage of respondents in each category n=102*
Parents lack financial resources to purchase computer and/or pay Internet access fees.	93%
Parents and/or students do not see the need for home computing/Internet Access.	31%
Parents have concerns over access to inappropriate materials on the Internet.	31%
Parents have concerns over Internet safety.	29%
The high-speed Internet connectivity options in our area are very limited and expensive (ex: satellite only).	26%
Only dial-up options are available.	16%
There are absolutely no Internet access options available to consumers in our area (dial-up or high-speed).	6%
Dial-up options in our area are still relatively expensive.	6%
There is no high-speed access available to consumers in our area.	4%
Others: Migrant/transient populations/Homes only with cell phones.	1%

Current State of Public Access

If students do not have home access to modern, Internet-connected computers, they may have access at public access sites such as libraries or community centers. Some may even find access through other family members, at a parents' work site, friends, or neighbors. With this broader definition, participants reported higher estimates of students' beyond-school access. However, the number of participants who were unable to estimate beyond-school access with this broader definition also increased. Responses of participants are summarized in the following table:

Table 7.4

What percentage of students in your school system do you estimate to have access to an Internet-connected, modern computer through public access sites or another location? (Select one.)	*Percentage of respondents in each category n=100*	*Percentage of respondents reporting home access n=101*
Less than 10% of students have access.	**9%**	**5%**
Between 11-30% have access.	**5%**	**16%**
Between 31%-50% have access.	6%	34%
Between 51%-70% have access.	4%	25%
Between 71%-90% have access.	**15%**	**9%**
Between 90%-100% have access.	**38%**	**1%**
I don't have enough information to estimate.	23%	11%

When asked whether public access was equitable to home access, 90% of respondents indicated "no" and only 10% indicated yes.

Table 7.5

Do you believe that public access is equitable to home access? (Select one.)	*Percentage of respondents in each category n=95*
Yes	**90%**
No	**10%**

Relationship between Beyond-school Access and Instructional Practices

In order to gauge the impact of beyond-school access and instructional practices, participants were asked to choose a statement that best represented the current situation in their school system. Ninety percent of respondents agreed that a perceived lack of beyond-school access restrains teachers from assigning technology-related work. Only 5% of respondents felt that teachers in their school system had enough confidence in beyond-school access levels to assign technology–related student work. Responses of participants are summarized in the following table:

Table 7.6

Which statement best describes the relationship between current levels of beyond-school access and teachers' instructional practices in your school system? (Select one.)	*Percentage of respondents in each category n=102*
Teachers are reluctant to assign student work that requires beyond-school access to the Internet, software, and a modern computer because they do not believe that all students have sufficient beyond-school access to complete these assignments.	55%
Teachers assign some classroom work that requires beyond-school access to the Internet, but they also allow non-tech or low-tech alternatives for those students who may not have adequate access to the Internet, software, and a modern computer.	35%
Teachers are comfortable assigning student work that requires beyond-school access to the Internet, software, and a modern computer because they are confident all students have sufficient beyond-school access to complete their assignments.	5%
Teachers try to finish all technology-related work during class because they feel that beyond-school assignments using technology would be unfair to students w/o access.	3%
Teachers have probably not considered the relationship between students' beyond school access and the student assignments made in class.	2%
Other:	0%

Strategies to Improve Beyond-school Access

In order to determine how school districts are striving to improve beyond-school access, participants were asked to choose strategies currently being deployed by their school system. The most common strategy, reportedly practiced by 57% of school districts, was to create critical web content that parents need. Thirty-five participants indicated that their school districts partner with public access sites, such as libraries, to ensure beyond-school access for students. Less than one-third of participants chose any of the other ten strategies. Only four percent reported that their school districts were working on low-cost Internet access solutions for families with economic needs, even though lack of financial resources was cited as the top barrier to beyond-school access. A full report of participants' responses is provided in the following table:

Table 7.7

What strategies is your school system deploying to promote beyond-school access to modern computing devices and the Internet? (Select as many as apply.)	*Percentage of respondents in each category n=102*
Creating the need for parents and students to have access by putting important information and instructional resources online.	57%
Ensuring students have access through public sites such as the library.	35%
Extending school hours for access to computers.	32%
Helping parents become computer/Internet literate so that they feel comfortable with a computer in their home and they have reasons to purchase/maintain a computer and acquire Internet access.	21%
Informing administrators, teachers and parents of the percentage of students w/ beyond school access to modern, Internet-connected computer.	20%
Educating parents on how to keep their children safe and to minimize students' access to inappropriate material.	15%
Opening the facilities on the weekends and/or evenings.	14%
Creating a computer check-out program.	12%
Educating parents on how to acquire computers and/or Internet access.	11%
Tracking beyond school access patterns.	8%
Working with municipalities and/or service providers to create "wireless" communities.	6%
Working with local service providers to provide low-cost solutions to all families with students in the school system or to families with demonstrated economic barriers to acquiring access.	4%
Other	0%

Summary and Implications for Planning: Beyond-school Access

Even though most of their perceptions are not based on actual data collection, many participants believe that students in their school system have limited access to modern Internet computers beyond school (see Tables 7.1, 7.2, 7.4). They also believe that this limited access constrains teachers' willingness to fully implement a technology-rich curriculum (see Table 7.6). Lack of resources was selected as the primary reason to explain the lack of home access (see Table 7.3), but school districts were either not implementing or not able to implement strategies to ease these economic factors (see Table 7.7). Since beyond-school access is critical to provide equity, to enable desired 1:1 configurations, and to give teachers the confidence to implement 21st Century teaching and learning practices, a more precise measure of beyond school access is needed. If beyond school access levels are actually as low as perceived by participants in this study, strategies for improving beyond-school access must be deployed.

Infrastructure for 21st Century Learning

With discounts from a consolidated E-rate application and state funds from the legislature, the Georgia Department of Education is able to procure high-speed Internet connectivity for each public school system in Georgia. It is then incumbent upon each district to aggregate this bandwidth to their schools and classrooms via wide-area and local-area networks (WANs/LANs). To assess the current status of this infrastructure and to determine future growth, this section addresses the following questions:

1. *To what extent are educators satisfied with the existing technology infrastructure for Georgia's schools?*
2. *What are current challenges to providing an adequate infrastructure for education?*
3. *What infrastructure solutions are school districts likely to deploy in the future?*

Satisfaction and Challenges with Current Infrastructure

State Network

Over half of participants (51%) reported moderate levels of satisfaction with current bandwidth provided by the state network and thirty-two percent reported high levels of satisfaction. Only 18% reported low levels of satisfaction. Reasons cited for their discontent included slow downs during certain times of the day and the rapid increase in the use of the network for video applications, online assessment, and data transfer/reporting. Other data seems to support claims that the state network may not be meeting the needs of all districts. For example, 28% of participants indicated that their school system supplements bandwidth provided by the state network. When asked their reasons for procuring additional bandwidth, 88% of participants selected "additional bandwidth is needed to support our applications." Other reasons cited included redundancy (39%) and additional security (3%). Although 26 district representatives noted that their school system supplemented the state bandwidth, many others indicated that there were few or no local resources to procure additional services beyond what the state network provides. Participants' satisfaction levels with current bandwidth and their reasons for securing additional bandwidth are also summarized in the following tables:

Table 8.1

To what extent are you satisfied with the current bandwidth provided by the state network? (Select one.)	*Percentage of respondents in each category n=101*
Low-I am not satisfied with the current bandwidth provided by the state network. Our needs exceed our current bandwidth.	18%
Moderate-I am reasonably satisfied with our current bandwidth from the state network. Current bandwidth meets our needs most of the time, but there are occasions when we need additional bandwidth –or- our current bandwidth is nearly maximized and we will need additional bandwidth in the future.	51%
High-I am very satisfied with our current bandwidth from the state network. Current bandwidth meets our current needs.	32%

Table 8.2

Does your school system supplement the state network bandwidth with additional Internet connectivity? (Select one.)	*Percentage of respondents in each category n=92*
Yes	28%
No	72%

Table 8.3

What is the reason(s) for this additional connectivity? (Select as many as apply.)	*Percentage of respondents in each category n=26/26*
Additional bandwidth needed to support our applications.	88%
Redundancy when State Network is down.	42%
Additional security (for example, to segment administrative network from instructional network).	3%

As summarized in the table below, participants also expressed high levels of satisfaction with the level of service provided by Bell South, the current contracted service provider for the state network.

Table 8.4

To what extent are you satisfied with the current level of service provided by the State Network (Bell South Contract)? (Select one.)	*Percentage of respondents in each category n=95*
Low - I am not very satisfied with the current level of service for the state network.	11%
Moderate - I am reasonably satisfied with the current level of service for the state network.	39%
High - I am very satisfied with the current level of service for the state network.	51%

LAN/WAN

Participants generally reported high levels of satisfaction with their current LAN/WAN solutions, as well. For example, 57% of respondents reported a high level of satisfaction with their current Wide Area Network (WAN) and 49% indicated high rating for their existing LANs. These data are presented in the following tables:

Table 8.5

To what extent are you satisfied with the infrastructure between the district network and the schools in your school system? (Select only one.)	*Percentage of respondents in each category n=97*
Low- I am not satisfied with our current district network between schools.	14%
Moderate – I am reasonably satisfied with current district network between schools.	29%
High – I am very satisfied with our current network between schools.	57%

Table 8.6

To what extent are you satisfied with the local area networks in your schools? (Select only one.)	*Percentage of respondents in each category n=97*
Low – I am not satisfied with our current local area networks in the schools.	10%
Moderate – I am reasonably satisfied with our current local area networks in the school.	41%
High – I am very satisfied with our current local area networks in the schools.	49%

The most common LAN/WAN-related challenges included upgrading the existing infrastructure to fiber and replacing/upgrading aging switches, routers, and servers. Others also mentioned challenges related to beyond-school access, as outlined in Section 7, and to implementing wireless solutions, as defined in the following discussion on future deployments

Future Infrastructure Solutions

Wireless networking has emerged as a promising innovation for school settings. Wireless allows for safer, more flexible learning environments and new configurations, such as 1:1 computing. For these reasons, questions on future infrastructure solutions focused on wireless technologies. Interest in exploring wireless for instruction was high among participants. Over half (65%) indicated that they were currently considering wireless LAN solutions and 17% were considering wireless WANs. As represented in the following table, only 18% of participants were not considering wireless as a current option for their school system for myriad of reasons, including that their schools are already wireless:

Table 8.7

Are you considering wireless technologies for future WAN/LAN solutions? (Select only one.)	*Percentage of respondents in each category n=88*
Not Considering.	18%
Considering for WAN connections between schools.	17%
Considering LAN solutions in each school.	65%

In spite of the interest, over half of participants (56%) expressed great concern about the performance of wireless networks. Many included comments about the limitation of wireless to support many educational applications, such as database applications, educational software, and video. Concerns over security also topped the list of barriers for 53% of respondents. Other concerns identified as barriers were lack of equipment to utilize a wireless environment (31%); lack of experience among staff to manage wireless networks (20%); architectural barriers such as thick walls in schools (20%); geographic barriers such as hills or tall buildings disrupting line of site (19%); and insufficient information on wireless to make choices (4%). Only 7% indicated no barriers to implementing wireless. Participants' responses to these and other possible barriers to implementing wireless networks are summarized in the table below:

Table 8.8

What are your current barriers to implementing wireless WAN/LAN solutions? (Select as many as apply.)	*Percentage of respondents in each category n=102*
Concerns about wireless performance.	56%
Concerns about security.	52%
Lack of equipment to utilize wireless environments.	31%
Lack of experience among technical staff to manage wireless environments.	20%
Architectural Barriers.	20%
Geographic Barriers.	19%
No Barriers.	7%

On one hand, these concerns may emerge from an assessment of current equipment. For example, laptops comprised only 17.8% of computers in schools based on the 2005-2006 state Technology Inventory. On the other hand, these concerns may result from a lack of affordable wireless computing devices on the market. Both reasons were cited in participants' comments.

Summary and Implications for Planning: Infrastructure

Most participants expressed great appreciation for and satisfaction with the state network for Internet access (see Tables 8.1, 8.4). However, they also expressed concern

about limited bandwidth to support growing demands and new applications. In fact, 28% of respondents indicated that their system supplements bandwidth and that the primary reason for these additional contracted services was to provide additional bandwidth to meet district demands (see Tables 8.1, 8.2, & 8. 3). These reports may warrant additional data collection on the actual demand on state network bandwidth. If concerns are confirmed, an increase in bandwidth may be necessary.

Districts also expressed high levels of satisfaction with their current LAN/WAN solutions (see Tables 8.5, 8.6), but at the same time they noted the challenges of replacing network equipment and implementing wireless solutions to support new technical arrangements (8.7, 8.8). This information suggests that school districts may need extensive support in the next five years to assess, select, and implement wireless technologies for 21st Century learning environments.

Technology Support for 21st Century Learning

In order to assess the current status of technology support in Georgia's schools, items to address the following questions were constructed and administered:

1. *To what extent are Georgia's school districts currently able to keep technologies operable for instructional and administrative uses?*
2. *What current challenges impede Georgia school districts from keeping technologies operable for instructional and administrative uses?*
3. *What strategies must be deployed to improve technical support and operability in Georgia's school districts?*

The following responses from school system technology leaders provide insight to these issues:

Current Status of Technology Support

A majority of respondents (93%) categorize their satisfaction level with current technology support programs as either moderate (66%) or high (23%). Only 7% indicated

low satisfaction with their system's current capacity to keep technology operable for instructional and administrative uses.

Table 9.1

To what extent are you satisfied with your system's current capacity to keep technology operable for instructional and administrative uses? (check only one)	*Percentage of respondents in each category n=101*
Low- We struggle to keep current inventories of technology operable and maintained. "Down time" seriously impedes instructional and/or administrative efforts to integrate technology into daily practice. Educators in our buildings frequently complain about response time and/or inoperability.	7%
Moderate – We make a good effort to keep current inventories of technology operable and maintained, but we are only moderately able to do so. While we achieve moderate levels of operability, there are still gaps in service and technical support that impact instructional and administrative functions.	66%
High – Our equipment is operable, dependable, and well-maintained. Teachers and administrators have high confidence levels that technology will support their practices in a consistent and reliable way.	26%

Current Barriers to High-Quality Technology Support

When participants were asked to indicate the challenges to keeping technology operable in their school districts, 77% selected aging equipment as one of their responses and 60% indicated that insufficient funds to hire staff and/or outsource maintenance was a factor. Inexperienced users (37%) and technical support staff (23%) were also blamed for at least some of the existing technical support woes. Other barriers included lack of policies, procedures, tools and processes to manage technical support more efficiently (27%); inability to retain experienced technical staff (14%); and inability to recruit technical staff (7%). The following chart also represents participants' responses.

Table 9.2

Which of the following present challenges to keeping technologies operable in your school system? (Select all that apply.)	*Percentage of respondents in each category n=102*
Aging equipment.	**77%**
Insufficient funds to hire staff and/or outsource maintenance.	**60%**
Inexperienced users who need more technology training.	37%
System lacks policies, procedures, tools, and processes to manage technical support efficiently (centralized maintenance, web-based support forms, desktop security software, lab procedures, purchasing policies, etc.).	**27%**
Inexperienced staff that lack technical skills to keep technologies operable.	23%
Inability to retain experienced technical staff.	**14%**
Inability to recruit experienced staff.	7%

Strategies for Improving Technical Support

When selecting from a list of possible strategies to improve operability and performance, sixty-four percent of participants indicated that purchasing or leasing new equipment with current service agreements and warranties would ease current technical support issues. Creating new positions for technical support (58%) was the second, most-commonly selected strategy, followed by building the skill level of existing or potential staff (54%) and increasing the pay scale for technical employees (53%). Other strategies selected included developing maintenance and repair procedures (29%) and developing new policies to reduce repair and maintenance (28%). Fewer than 20% of participants felt that outsourcing (19%), training agreements with existing employees (16%), or better recruiting for technical staff (6%) would improve technical support programs in their school districts. A summary of these responses is represented in the following table:

Table 9.3

Which specific strategies must be deployed in order to improve technical support in your school system in the future? (Select all that apply.)	*Percentage of respondents in each category n=102*
Purchase or lease new equipment w/ current service agreements/warranties.	**64%**
Create new positions for technical support.	**58%**
Build skill level of existing staff or potential staff.	54%
Increase pay scale for technical employees.	**53%**
Acquire technology-based management tools to ease maintenance and repairs (centralized management systems.	38%
Develop maintenance and repair procedures and protocols to communicate with educators requesting service (web forms, priority lists).	**29%**
Develop new policies and procedures that reduce repair and maintenance (purchasing policies, user procedures).	28%
Consider outsourcing maintenance and repair.	19%
Implement training agreements where employees commit to a specified time of service in return for training.	16%
Develop strategies to recruit high-quality technical employees.	6%

Summary and Implications for Planning: Technology Support

Participants expressed moderate to high levels of satisfaction with technology support in their school system (see Table 9.1), but they also noted that aging equipment and insufficient staffing presented challenges in the areas of technology support (see Table 9.2). In alignment with identified challenges, participants desired newer equipment, more staff, and better qualified staff (see Table 9.3).

Educator Proficiency and Professional Learning

The following section assesses the current capability of teachers and administrators to improve their practices through the effective uses of technology. The section also addresses technology-related professional learning programs necessary to ensure educators' high-level performance. Specifically, included items are designed to address the following questions:

1. *To what extent are Georgia's teachers and administrators able to effectively integrate technology into their daily practices for the purposes of school improvement?*
2. *What types of professional learning do teachers and administrators currently need to improve their ability to use technology for school improvement?*
3. *To what extent is technology-related professional learning integrated into all professional learning programs in Georgia school districts?*
4. *To what extent are Georgia's school districts able to provide the technology-related professional learning programs necessary to improve educators' technology literacy and performance?*

Educator Proficiency

When asked to assess the ability of teachers and administrators to integrate technology into their daily practices, 24% of participating technology leaders reported that teachers in their school districts still lacked basic skills and were only able to use technology for instruction in very simple and minimal ways. A majority of

participants (73%) believed that teachers are somewhat skilled in using technology for instruction, but still lacked the skills necessary to maximize the use of technology in their classrooms. A small minority of participants (4%) indicated that most of the teachers in their school districts were fluent with technology and able to integrate it seamlessly into their daily practices.

Participants' assessments of administrators were similar to those of teachers. One-fourth of the technology leaders providing responses believed that administrator proficiencies in their school system were very low. Sixty-five percent believed that administrators had a moderate level of proficiency, but still needed great improvement. A much smaller number (10%) believed that administrators in their school system exhibited high levels of technical competency and technology integration.

These data are also reported in the following tables:

Table 10.1

How would you describe teachers' current ability to effectively integrate technology into standards-based, research-based instructional practices? (check only one)	*Percentage of respondents in each category n=102*
Low- Most of our teachers are able to use technology for instruction only in very simple and minimal ways. They still lack basic technology skills and have very little knowledge on how to use technology effectively for instruction.	24%
Moderate – Most of our teachers are somewhat skilled in using technology for instruction. They have become proficient in several types of applications and are able to integrate these into instruction, but there are many more things they could do! They still lack the skills necessary to maximize the use of technology in their classrooms.	73%
High – Most of our teachers are fluent with using technology for instruction and for supporting their own professional practice. While everyone can always learn more, their skill level allows technology to be a positive, pervasive, and transparent medium for both student and professional learning. Their skill level also allows them to evaluate and integrate new technologies into their practice easily.	4%

Table 10.2

How would you describe administrators' current ability to use technology effectively in their professional practice? (check only one)	*Percentage of respondents in each category n=102*
Low- Most of our administrators are only able to use technology to support their practice in very simple and minimal ways. They still lack basic technology skills and have very little knowledge on how to use technology effectively for their administrative tasks. They really cannot model effective technology use to staff, students, parents, and community.	25%
Moderate – Most of our administrators are somewhat skilled in using technology for instruction. They have become proficient in several types of applications and are able to integrate these into their practice, but there are many more things they could do! They still lack the skills necessary to maximize the use of technology for leadership and learning. They can only model very basic kinds of uses to staff, students, parents, and community.	66%
High – Most of our administrators are fluent with using technology to support their professional practice. While everyone can always learn more, their skill level allows technology to be a positive, pervasive, and transparent medium in the school culture. Their skill level also allows them to evaluate and integrate new technologies easily and to engage in the routine, intentional, and effective uses of technology to staff, students, parents, and community.	10%

Professional Learning Needs

In order to better understand the technology-related professional development needs in the State of Georgia, participants were asked the following open-ended questions: (1) How are teachers' primary learning needs related to instructional technologies? and (2) What are administrators' primary professional learning needs related to instructional and administrative technologies? Participants generated 68 responses directed toward teacher professional learning and 80 responses directed toward administrative learning needs. Responses for each question were coded and categorized based on subject matter. Since responses could address more than one topic, individual responses were often assigned one, two, or even three different codes.

Participants' responses directed toward teacher professional learning were coded in the following ways: (1) technology integration; (2) basic hardware and software skills; (3) both integration and technical skills; (4) classroom management; and (5) data collection. Some teacher-related responses were also coded as "quality," since these

comments referred to the qualities or characteristics of learning opportunities instead of the content.

Technology integration was the most-often mentioned learning need for teachers with 37 coded comments. Approximately one-third of these coded comments on integration also addressed the need to shift from traditional, teaching modes to student-centered instructional designs that were more aligned to the higher-order thinking skills inherent in the new GPS.

The category focusing on both technology integration skills and technical skills followed the stand-alone technology integration category with 24 coded responses. Hardware and software application skills placed third with 12 comments. These responses from participants suggest that technology integration is the primary need for Georgia teachers, but that skills training is also an important component of that training. Other professional learning needs mentioned included data analysis and utilization (8) and classroom management in technology-equipped instruction (3).

In addition to responses focused on the content of needed training, 10 comments addressed specific qualities of instruction that teachers needed. These qualities include job-embedded instruction, coaching, observation, modeling, ongoing support, and hands-on training. In addition, several comments addressed the need for different types of professional learning models based on either the assessed skill level/learning needs or the self-selected interests of participating teachers. Six responses were coded as non-specific since there was not enough information in the response to ascertain meaning.

The coded categories related to teacher learning needs and the number of responses from participants is represented in the table below:

Table 10.3

Coded responses to the open-ended question: What are teachers' primary learning needs related to instructional technologies?	*Number of responses related to each coded category*
Technology Integration	37
Technology Integration and Basic Technical Skills in Applications/Hardware	24
Basic Technical Skills in Applications/Hardware	12
Qualities of Teacher Professional Learning Related to Technology	10
Data analysis and utilization	8
Classroom management in technology-equipped classrooms	3
Non-specific	6

Of course, responses associated with administrative learning needs were slightly different from those related to teachers; however, the greatest number of responses (26) were still associated with issues related to instruction. Comments in this instructional category included helping administrators capture a vision for the ways technology can support student-centered, standards-based instruction and enabling them to evaluate effective technology integration.

The need for training in technology-supported data-informed decision making received the second greatest number of comments from participants (25), followed by helping administrators integrate technology into their own practices (13) and improving technical skills, especially in the area of productivity software (11).

Participants also believed that administrators needed to keep pace with emerging technologies; to support technology programs, especially by modeling and setting expectations for effective technology use (7) and to use technology to support parent/school/community communication via web applications (6). One comment was focused on quality, specifically the need for self-directed professional learning for administrators. Six were non-specific.

The following chart represents participants' coded responses to administrative professional learning needs:

Table 10.4

Coded responses to the open-ended question: What are administrators' primary learning needs related to instructional and administrative technologies?	*Number of responses related to each coded category*
Data analysis and utilization	27
How to support/evaluate technology integration	20
Basic technical skills in applications/hardware	13
Using technology to improve their own practice	11
Communication tools/Web development to communicate with staff & parents	3
Understanding emerging technology and their applications	2
Qualities (follows the interest of administrator)	2
How to model technology use to staff	2
Non-specific	5

Integration of Technology-related Professional Learning

Time for technology-related professional learning is most often cited as a primary barrier to educator proficiency and effective classroom use of technology; yet with so many other pressing learning needs, more time for stand-alone technology training also seems unlikely. Perhaps the only option available to K-12 educators is to work in cross-functional teams to integrate technology into other types of ongoing professional learning. To determine to what extent this type of integration is occurring in school districts, participants were asked to list the main foci of professional learning opportunities in their districts in the past year. They were also asked how technology-related learning goals were integrated and how technology use was modeled in these professional learning opportunities.

Seventy-one responses were provided to the open-ended question on the learning foci in school districts, and there was great consensus among respondents. Nearly all participants indicated that implementing the new GPS was the primary professional learning focus in their school system during the past year. Other topics included AYP, data collection/analysis, improving test scores, and implementing standards-based learning via instructional models such as Learning-Focused Schools and Understanding by Design.

When asked about technology-related learning goals and modeling technology in primarily professional learning programs, a majority of participants (69%) agreed that effective technology use was modeled and/or included in the primary learning initiatives but the treatment was rather light. Technology could have facilitated the delivery and/or technology topics could have been integrated into the topic much more effectively. In explaining their responses, participants made comments such as "Technology was used to present the information, but [teachers were] not always shown how to integrate technology into their actual classroom lessons." Twenty-one percent thought that effective technology use was either not modeled or not included in the primary learning initiatives in the school system at all. Only 10% of participants reported that all the professional learning programs in their school system modeled the effective technology use and fully integrated technology-related issues into content.

These data are also represented in the following table:

Table 10.5

To what extent was effective technology use modeled and technology-related topics integrated into these primary professional learning programs? (check only one)	*Percentage of respondents in each category n=97*
Low – Effective technology use was neither modeled nor included in the primary learning initiatives in our school system.	21%
Moderate – Effective technology use was modeled and/or included in the primary learning initiatives in our school system, but the treatment was rather light. Technology could have facilitated the delivery and/or technology topics could have been integrated into the topic much more effectively.	69%
High – Most of our administrators are fluent with using technology to support their professional practice. While everyone can always learn more, their skill level allows technology to be a positive, pervasive, and transparent medium in the school culture. Their skill level also allows them to evaluate and integrate new technologies easily and to engage in the routine, intentional, and effective uses of technology to staff, students, parents, and community. All the professional learning programs in our school system model effective technology use and fully integrate technology-related issues into content. Our programs model effective technology integration into content areas.	10%

Capacity to Provide Technology-related Professional Learning

In order to determine school districts' local capacity to deliver high-quality technology-related professional learning, participants were asked to rank their current capacity as low, moderate or high. Forty-three percent responded as low indicating that their system currently struggles to provide the technology-related professional learning that staff and community members need. Forty-two percent assigned a moderate rating which depicts the school system as somewhat successful in meeting training needs even though significant gaps also remain. Only 14% assigned their district a high capacity rating where meets of current staff and educational community members are being fully met.

These participant rankings are summarized in the following table:

Table 10.6

To what extent was effective technology use modeled and technology-related topics integrated into these primary professional learning programs? (check only one)	*Percentage of respondents in each category n=99*
Low – Our system currently struggles to provide the technology-related professional learning that staff and community members need.	43%
Moderate – Our system provides a great deal of the technology-related professional learning that staff and community members need, but we also have significant gaps that we do not have the capacity to provide.	42%
High – Our system provides a comprehensive menu of technology-related professional learning that meet the current needs of staff and community members.	14%

Summary and Implications for Planning: Educator Proficiency and Professional Learning

Few participants indicated high levels of confidence in teacher and administrative proficiency (see Tables 10.1, 10.2). They also provided key input on their preferred priorities for professional learning (see Tables 10.3, 10.4). For teachers, they advised professional learning in using technology in the classroom mixed with technical skill development. For administrators, they expressed a high need for professional learning related to data-informed decision making and understanding/evaluating effective

technology use in the classroom. In spite of these high needs, 42% of school systems expressed limited capacity to meet the professional development needs of their teachers and administrators (see Table 10.6) and limited success in integrating technology-related topics into other mainstream professional learning initiatives (see Table 10.5). To ease these tensions, school systems need access to low-cost, high-quality professional learning programs targeted toward district priorities. Since time for professional learning is limited, data also suggests that they need technology-related topics integrated into other types of high-priority professional learning programs such as GPS and School Improvement training, for example.

Technology Literacy

Title II, Part D of the Elementary and Secondary Education Act "No Child Left Behind" (2001) states that every child will be technologically literate by the end of eighth grade. In Georgia, *technology literacy* is defined as "the ability of students to use the tools of their society with skill in an ethical, accurate, and insightful manner to meet the demands of the 21st Century workplace and world. This includes the ability to use appropriate technology responsibly to solve problems and to create knowledge and learning by accessing, managing, evaluating, analyzing, integrating, synthesizing, and communicating information." Georgia's Technology Integration Standards (TIS) adopted by the State Board of Education in February 2002 further define what students should know and be able to do to meet this definition of technology literacy.

In order to determine the current status of Georgia's school districts in monitoring and meeting technology literacy goals, this section addresses the following questions:

1. *What strategies are Georgia's school districts deploying to ensure that students are technologically literate?*
2. *To what extent are teachers implementing the TIS in Georgia's classrooms?*

3. *To what extent are Georgia's students technologically literate?*

Strategies to Ensure Technology Literacy

To determine school districts' current progress, participants were asked to select from a list of possible strategies targeted toward improving student technology literacy. The most commonly-deployed strategy was making school board members aware that the State BOE had adopted the TIS (47%), but less than half of represented school districts had completed this basic action. Approximately 35% of participants indicated that professional learning for teachers had taken place. Data indicate that fewer school districts have published the TIS (24%); provided best-practice models of implementing the TIS (17%); aligned TIS to GPS (15%); or monitored TIS implementation (14%). Only 9% had tools and procedures in place to monitor the student achievement of the TIS. These strategies and the percentage of respondents who indicated that their school system had deployed each strategy are further summarized in the following table:

Table 11.1

What steps have you taken toward ensuring that all students in your school system are technology literate? (Select all that apply.)	*Percentage of respondents in each category n=102*
Our school system has made the local Board of Education and system members aware that the Georgia State Board of Education adopted Technology Integration Standards into the state curriculum in 2002 and that all Georgia school districts are responsible for integrating these skills into the standards-based curriculum.	**47%**
Our school system has provided professional learning opportunities and dedicated staff to assist teachers in integrating the Technology Integration Standards into teaching and learning.	35%
Our school system has published the state's Technology Integration Standards (or local technology standards aligned to state standards) as part of local curriculum.	24%
Our school system collects and disseminates best practice examples of the integration of technology and academic standards.	17%
Our school system has aligned specific technology integration standards to core academic learning standards so that teachers can see "how" technology integration can occur. This alignment also ensures that all technology standards are appropriately infused into the content areas instead of being taught in isolation and that our students will have opportunities to address all the TI standards fully during the course of their academic preparation.	15%
Classroom practice is monitored to ensure that the Technology Integration Standards are being implemented and that all students have the opportunity to achieve the standards.	14%
Student progress toward the Technology Integration Standards is assessed and student progress toward technology literacy is reported at the system level.	9%
Other	0%

In addition to selecting strategies currently being deployed, participants were also asked if they were addressing student technology literacy in any way. As represented in the following table, thirty-six percent of participants said their school system currently had not taken any formal action to address student technology literacy:

Table 11.2

Is your school system addressing student technology literacy in any way?	*Percentage of respondents in each category n=102*
Yes, our school system has implemented at least one of the strategies listed above.	**64%**
No, our school system has not formally addressed student technology literacy skills in any way.	**36%**

TIS implementation levels

School system representatives participating in this study were asked to estimate what percentage of teachers in their district was implementing the TIS in their classrooms. Twenty-seven percent responded that they did not have enough information to estimate. Over half of respondents believed that less than 50% of teachers in their school system were addressing the TIS. Nineteen percent believed that over half of their teachers were implementing TIS. A full summary of participant responses are provided in the following table:

Table 11.3

What percentage of teachers in your school system do you estimate are implementing the technology integration standards in their classrooms? (Select one.)	*Percentage of respondents in each category n=99*
Less than 10%	**17%**
Between 11-30%	**22%**
Between 31%-50%	14%
Between 51%-70%	10%
Between 71%-90%	**9%**
Between 90%-100%	**0%**
I don't have enough information to estimate.	27%

Student Technology Literacy Levels

In order to gather information on the current levels of student technology literacy in Georgia, participants were asked to estimate the percentage of students in their school

system who currently meet all TIS. Over half (57%) said that they did not have enough information to estimate current student technology literacy levels. Twenty-five percent of respondents estimated that less than half of their students were meeting all of the technology-related standards and only five percent estimated that over half of their students were meeting standards. Results are fully represented in the following table:

Table 11.4

What percentage of students in your school system has met all the Technology Integration Standards? (Select one.)	*Percentage of respondents in each category n=97*
Less than 10%	**9%**
Between 11-30%	**11%**
Between 31%-50%	5%
Between 51%-70%	3%
Between 71%-90%	**1%**
Between 90%-100%	**1%**
I don't have enough information to estimate	57%

Summary and Implications for Planning: Technology Literacy

Responses in this section indicate that Georgia schools are in the early stages of implementing a coordinated curricular program resulting in technology literate students. School systems are not implementing a full range of strategies to ensure technology literacy in students (Table 11.1) and 36% of school systems are taking no actions toward technology literacy at the present time (Table 11.2). Data also indicate that few teachers are implementing Georgia's Technology Integration Standards (TIS); few school systems are monitoring the implementation of the TIS; and few are assessing technology literacy. As a result, over half of participants were unsure of the technology literacy level of students in their school system (see Tables 11. 3, 11.4). Based on these results, school systems need technical assistance in implementing strategies targeted toward improving and assessing technology literacy.

Section Four: Georgia's Technology Vision

GEORGIA TECHNOLOGY VISION
Georgia will lead the nation in improving student achievement by ensuring that all educators and students have the knowledge and skills necessary to be successful in a global learning community.

In order to make the above Georgia Technology Vision a reality, state leaders must have a plan to ensure the following:

Technology use in schools will be:

- Diverse, using the full range of appropriate tools that can enhance learning;
- Seamlessly integrated into the GPS/QCC core academic standards, particularly in areas which promote higher-order thinking and problem solving; and,
- Central to the learning process.

Students will become *technology literate* in using the tools of their society with skill in an ethical, accurate, and insightful manner to meet the demands of the 21st Century workplace. This includes the ability to use appropriate technology responsibly to:

- Find, synthesize, analyze, represent, apply, and share information in new ways;
- Collaborate and communicate with others for the purposes of learning; and,
- Connect to learning activities that are meaningful, interesting, relevant, and challenging to them.

Educators will use technology to:

- Facilitate new ways of implementing instruction and of assessing learning with data utilization;
- Develop instructional strategies targeted toward needs;
- Keep abreast of emerging trends and new technologies; and
- Enhance their professional skills and knowledge.

Parents will use technology to:

- Conduct basic business operations, such as registration and consent transactions with the schools;
- Communicate with local educators, and
- Monitor their children's academic progress.

Community members will use technology to:

- Bring valuable learning resources, such as mentors, content, and tools, to the learning process.

Section Five: Georgia Technology Goals

After a careful review of the national scan, the state scan, and the findings of the state-wide survey, the gaps between the current reality in Georgia schools and our state-wide technology vision were identified and the following seven technology goals were formulated. In the subsequent section, these goals are repeated, along with accompanying performance objectives, benchmarks, strategies, timelines, and evaluation sources.

Technology Goals
1. Increase broad-based community support for Georgia's ***vision*** to infuse 21st Century technology skills into the Georgia curriculum.
2. Increase ***educators' proficiency*** in effective ***instructional uses*** of technology in order to incorporate 21st Century technology and thinking skills into the Georgia curriculum.
3. Increase K-12 **students' proficiency** in technology literacy and 21st Century skills.
4. Increase effective ***administrative uses*** of technology to monitor student achievement and to manage business operations in school systems.
5. Increase the capacity of school systems to provide the high-quality ***system support*** necessary to realize effective technology use, especially in the areas of administrative support for effective instructional technology use; professional development; technical support for hardware, software, network infrastructure, technology planning, and program evaluation.
6. Achieve and/or maintain ***equitable access to high-quality technology programs*** for all students.
7. Increase ***access*** for students, educators, parents, school board representatives, and other community members to technology resources that can enhance student learning.

Section Six: Goals, Performance Objectives, Benchmarks, Strategies, Timelines, and Evaluation Sources

***Goal 1:* Increase broad-based community support for Georgia's vision to infuse 21st Century skills, including the effective use of technology, into the state curriculum.**

Performance Objectives:

1) A survey administered in the spring of 2012 will show 100% of school and system staff members are supportive of Georgia's technology vision.
2) A survey administered in the spring of 2012 will show 75% of parents and community members are supportive of Georgia's technology vision.
3) By the spring of 2012, a minimum of two state research studies will be published showing that the effective use of technology increases student achievement.

Benchmarks:

(1) In the spring of 2009, 75% of school and system staff members will be supportive of Georgia's technology vision when surveyed by school systems
2) In the spring of 2009, 50% of parents and community members will be supportive of Georgia's technology vision when surveyed by school systems
3) By the spring of 2009, a minimum of one state research study will be published showing that the effective use of technology increase student achievement.

STRATEGIES	*TIMELINE*	*EVALUATION SOURCES*
Hold annual community meetings across the state on 21st Century learning skills	2008-2012	Annual opinion survey administered to community members
Provide local civic clubs and organizations with school system speakers on the subject of 21st Century learning skills	2008-2012	Annual opinion survey administered to community members
Define and explain 21st Century learning skills at as many parental meetings as applicable	2008-2012	Annual opinion survey administered to parents
Disseminate information to faculty that focuses on teaching 21st Century skills that students need in order to be successful workers in a global environment	2007-2012	Annual opinion survey administered to school staff members
Conduct and publish research studies to show that the effective uses of technology increases student achievement	2007-2012	Research reports

***Goal 2:** Increase **educators' proficiency** in effective **instructional uses** of technology in order to incorporate 21st Century technology and thinking skills into the Georgia curriculum.*

Performance Objectives:

1) By 2012, state evaluation sources will show that 100% of all teachers have been trained and feel confident about the use of technology as a teaching and learning tool to incorporate 21st Century technology and thinking skills into the Georgia curriculum.

Benchmarks:

(1) By 2009, state department evaluation sources will show that 75% of all teachers have been trained and feel confident about the use of technology as a teaching and learning tool to incorporate 21st Century technology and thinking skills into the Georgia curriculum.

(2) By 2012, state department evaluation sources will show that 95% of all teachers have been trained and feel confident about the use of technology as a teaching and learning tool to incorporate 21st Century technology and thinking skills into the Georgia curriculum.

STRATEGIES	***TIMELINE***	***EVALUATION SOURCES***
Train educators directly or have Train-the-trainer sessions at the thirteen regional Educational Technology Training Centers (ETTCs)	2007-2012	ETTC computer records of course trainings; state department survey
Trained educators will train peer educators within school systems	2007-2012	School system records of course trainings; state department survey
Have ETTC instructional staff members teach requested courses on-site in school systems	2007-2012	ETTC computer records of course trainings; state department survey
Seek funding to support the teaching of 21st Century skills	2008-2012	Record of technology funds allotted to Division of Instructional Technology and to school systems
Employ a full-time GaDOE Program Manager to lead and direct the thirteen ETTCs toward more creativity and continuity in regional training and support services	Jan 2008 - Ongoing	GaDOE personnel records
Develop standards of service for ETTCs to ensure accountability and more uniformity	2007-2009	ETTC Standards Document
Continue to adequately fund staff positions and programs at ETTCs	2007-2012	GaDOE funding reports
Maintain website for educators to share "Best Practices in the Use of Technology"	2007-2012	Website records
Encourage and assist educators in uploading to the Georgia website entitled "Best Practices in the Use of Technology"	2007-2012	Website records

Align Georgia Performance Standards with ISTE Standards	2007-2009	Alignment documents
Provide teachers and administrators with professional development that prepares them to teach, monitor, and assess student learning of 21st Century skills	2007-2012	Training records of GaDOE, ETTCs, and RESAs
Provide staff access to 21st Century tools	2007-2012	System technology Plans, CLIP
Train teachers to use technology to differentiate instruction	2007-2012	Training records, classroom observations
Provide Title IID Competitive Funds for use in Title I needs-improvement schools in LEAs with high economic and academic needs	2007-TBA	GaDOE funding records
Continue to develop and expand *GeorgiaStandards.org* to include a database of technology-based learning resources aligned to the GPS/QCC (i.e., online projects, software titles, lessons adapted for Special Education learners)	2007-2012	Study of web site; state teacher survey
Support and monitor the Professional Standards Commission's existing technology proficiency requirements for certification and re-certification	2007-2012	Certification Documents
Promote technology integration criteria in teacher evaluation documents/ procedures	2007-2012	Teacher Evaluation Documents
Develop and promote online learning opportunities for school system personnel and for high school and middle school students through Georgia Virtual School and other e-Learning projects	2007-2012	Training and teaching records of GAVS; GAVS enrollment data
Promote and expand the use of statewide online resources, such as GALILEO and Georgia Public Broadcasting digital content	2007-2012	Study of web site; state teacher survey, usage statistics
Disseminate research-based frameworks for effective technology use, such as, but not limited to, Level of Technology Implementation (LoTI) framework, NCREL's Engaged Learning Indicators, the Partnership for 21st Century Skills, ISTE's NETS-T framework.	2007-2012	Training records
Collect and disseminate scenarios of effective instructional technology use by all Georgia teachers, including Special Education	2007-2012	Training records

***Goal 3:* Increase K-12 *students' proficiency* in technology literacy and 21st Century skills.**

Performance Objectives:

1) In the spring of 2012, 90% of all Georgia eighth grade students will make a passing score on a common eighth grade technology literacy assessment.
2) In the spring of 2012, 95% of all Georgia students will make passing scores on the Georgia standardized tests (CRCT and GHSGT), which will include the testing of 21st Century skills.

Benchmarks:

1) By January of 2008, a common eighth grade technology literacy assessment will be available for use by all Georgia middle schools.
2) In the spring of 2010, 75% of all Georgia eighth grade students will make a passing score on a common eighth technology literacy assessment.
3) In the spring of 2010, 75% of all Georgia students will make passing scores on the Georgia standardized tests (CRCT and GHSGT), which will include the testing of 21st Century skills.

STRATEGIES	***TIMELINE***	***EVALUATION SOURCES***
Collaborate with GaDOE Curriculum Division to imbed information and communication literacy into the Georgia Performance Standards through the addition of required technology elements for each standard	2007-2009	Minutes of meetings; GPS documents with technology elements infused
Collaborate with GaDOE Curriculum Division to embed ICT literacy into assessments for core subjects	2007-2012	Minutes of meetings; GPS; student assessment documents
Develop a common assessment to monitor the progress of Georgia's eighth graders in technology literacy (based on ISTE and Georgia Technology Standards)	2007-2008	Eighth Grade Technology Literacy Assessment
Continue to develop and expand *GeorgiaStandards.org* to include a database of technology-based learning resources aligned to the GPS/QCC (i.e., online projects, software titles, lessons adapted for Special Education learners)	2007-2012	Study of website; state teacher survey
Promote and expand the use of statewide online resources, such as GALILEO and Georgia Public Broadcasting digital content	2007-2012	Study of website; state teacher survey
Develop and promote online learning opportunities for school system personnel and for high school and middle school students through Georgia Virtual School and other e-Learning projects	2007-2012	Training and teaching records of e-Learning opportunities and enrollment
As a cost-cutting measure for school systems, promote the use of electronic textbooks when appropriate	2007-2012	Hardware and equipment surveys

***Goal 4:* Increase effective *administrative uses* of technology to monitor student achievement and to manage business operations in school systems.**

Performance Objectives:

1) By the spring of 2012, 100% of Georgia schools' administrative staff will report in a state-wide survey that they are using technology seamlessly in their positions, both to monitor student achievement and to complete all state required reports and records.

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Benchmarks:

1) By the spring of 2009, 75% of Georgia schools' administrative staff will report in a state-wide survey that they are using technology seamlessly in their positions, both to monitor student achievement and complete all state required reports and records

STRATEGIES	*TIMELINE*	*EVALUATION SOURCES*
Provide administrators with access to data analysis software	2007-2012	System technology purchasing records; GaDOE portal; State-wide survey of school and system administrators
Provide administrators with training on data analysis software	2007-2012	Training records of GaDOE, ETTCs, RESAs, System Technology Coordinators
Increase communication and collaboration with teachers and parents to support teaching and learning for the 21st Century	2007-2012	Communication artifacts
Recognize school and system administrators who model the use of technology in educational settings	2007-2012	Awards Ceremonies; GaDOE publicity
Provide training and technical assistance for administrative applications of technology including: interactive reports, online standardized testing, e-grants program, student information systems, online data collections, and web-enabled consolidated application for funding	2007-2012	Training records

Goal 5: ***Increase the capacity of school systems to provide the high-quality system support necessary to realize effective technology use, especially in the areas of administrative support for effective instructional technology use; professional development; technical support for hardware, software, network infrastructure, technology planning, and program evaluation.***

Performance Objectives:

1) By the spring of 2012, based on information obtained from the evaluation sources cited below, 100% of all school system technology personnel will have the skills needed to provide high-quality system support for school systems.
2) Between the years of 2007 and 2012, state funding expenditures for technology will increase by 20%.

Benchmarks:

1) By the spring of 2009, based on information obtained from the evaluation sources cited below, 75% of all school system technology personnel will have the skills needed to provide high-quality system support for school systems.
2) Between the years of 2007 and 20010, state funding expenditures for technology will increase by 10%.

STRATEGIES	***TIMELINE***	***EVALUATION SOURCE***
Seek local funding to add needed technical and/or instructional support personnel	2007-2012	System funding reports
Seek funding from the Georgia legislature to hire additional technical and/or instructional support personnel for schools systems	2008-2012	GaDOE funding reports
Hire additional qualified technical and/or instructional support personnel as needed	2008-2012	System personnel records
Ensure that technical and/or instructional system support personnel are well trained to fulfill their assigned responsibilities	2007-2012	System training records
Provide technical support and tools to enhance system-level technology planning processes and products	2007-2012	GaDOE and ETTC records
Provide technical support and tools to enhance technology program evaluation at the local level	2007-2012	GaDOE and ETTC records
Develop and promote administrative applications for technology including: interactive reports, online standardized testing, electronic grant application programs, student information systems, online data collections, and web-enabled consolidated application for funding	2007-2012	GaDOE and ETTC records

***Goal 6:** Achieve and/or maintain **equitable access to high-quality technology programs** for all students.*

Performance Objectives:

1) By the spring of 2012, the following cited evaluation sources will show that 100% of Georgia students have equitable access to high-quality technology programs.
2) By the spring of 2012, the following cited evaluation sources will show that 100% of all students needing assistive technology will have continuous access.
3) Between April 2007 and April 2012, the State Technology Inventory will show that the number of students per instructional computer will decrease from 3.5 to 2.0.

Benchmarks:

1) By the spring of 2009, the following cited evaluation sources will show that 75% of all Georgia students have equitable access to high-quality technology programs.
2) By the spring of 2009, the following cited evaluation sources will show that 75% of all students needing assistive technology will have continuous access.
3) Between April 2007 and April 2010, the State Technology Inventory will show that the number of students per instructional computer will decrease from 3.5 to 2.9.

STRATEGIES	*TIMELINE*	*EVALUATION SOURCES*
Continue to lower the student/computer ratio	2007-2012	GaDOE Technology Inventory
Ensure that all facilities within a school system have equitable access to high-quality technology programs	2007-2012	GaDOE reports, School system reports
Ensure that all students within each school have equitable access to high quality technology programs	2007-2012	GaDOE reports, School system reports
Ensure that the needs of students requiring assistive technology are met	2007-2012	Special Education reports; GaDOE Technology Inventory
Maintain and upgrade state network for Internet access	2007-2012	GaDOE Internet records
Collect and disseminate information on emerging technologies	2007-2012	GaDOE and ETTC dissemination records

***Goal 7:** Increase access for students, educators, parents, school board members, and other community members to technology resources that can enhance student learning.*

Performance Objectives:

1) In the spring of 2012, a survey of students, educators, parents, school board members, and other community members will demonstrate a 75% satisfaction rate with their access to technology resources.
2) By the spring of 2012, 100% of all school board members will use e-communication tools routinely in their meetings.

Benchmarks:

1) In the spring of 2009, a survey of students, educators, parents, school board members, and other community members will demonstrate a 50% satisfaction rate with their access to technology resources.
2) By the spring of 2009, 50% of all school board members will use e-communication tools routinely in their meetings.

STRATEGIES	***TIMELINE***	***EVALUATION SOURCES***
Assist schools with applications for E-rate funds to help provide school wiring infrastructure updates	2007-2012	State E-rate records; stakeholder satisfaction survey
Provide educators with the tools necessary to teach 21st Century skills	2007-2012	System purchasing records. stakeholder satisfaction survey
Train parents in the use of educational technology to enhance their own, as well as their children's learning opportunities	2007-2012	System training records, stakeholder satisfaction survey
Purchase laptops for all Georgia school board members and require paperless communications and meetings	2007-2012	System purchasing records, stakeholder satisfaction survey
Encourage and promote more wireless technology in schools, offices, and communities	2007-2012	State Technology Inventory reports
Actively seek the support of community leaders to mentor, teach, and support the use of technology in school systems	2007-2012	System public relations records, stakeholder satisfaction survey

Conclusion

Recognizing that technology is constantly changing, the Instructional Technology Division of the GaDOE will review this document annually and make needed changes. At the end of 2012, a report documenting our progress toward meeting our stated goals will be issued to all interested stakeholders.

Appendix A: National Technology Standards

National Educational Technology Standards for Students: The Next Generation

"What students should know and be able to do to learn effectively and live productively in an increasingly digital world …"

1. Creativity and Innovation

Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology. Students:

a. apply existing knowledge to generate new ideas, products, or processes.
b. create original works as a means of personal or group expression.
c.. use models and simulations to explore complex systems and issues.
d. identify trends and forecast possibilities.

2. Communication and Collaboration

Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others. Students:

a. interact, collaborate, and publish with peers, experts or others employing a variety of digital environments and media.
b. communicate information and ideas effectively to multiple audiences using a variety of media and formats.
c. develop cultural understanding and global awareness by engaging with learners of other cultures.
d. contribute to project teams to produce original works or solve problems.

3. Research and Information Fluency

Students apply digital tools to gather, evaluate, and use information. Students:

a. plan strategies to guide inquiry.
b. locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.
c. evaluate and select information sources and digital tools based on the appropriateness to specific tasks.
d. process data and report results.

4. Critical Thinking, Problem-Solving & Decision-Making

Students use critical thinking skills to plan and conduct research, manage projects, solve problems and make informed decisions using appropriate digital tools and resources. Students:

a. identify and define authentic problems and significant questions for investigation.
b. plan and manage activities to develop a solution or complete a project.
c. collect and analyze data to identify solutions and/or make informed decisions.
d. use multiple processes and diverse perspectives to explore alternative solutions.

5. Digital Citizenship

Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior. Students:

a. advocate and practice safe, legal, and responsible use of information and technology.
b. exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity.
c. demonstrate personal responsibility for lifelong learning.
d. exhibit leadership for digital citizenship.

6. Technology Operations and Concepts

Students demonstrate a sound understanding of technology concepts, systems and operations. Students:

a. understand and use technology systems.
b. select and use applications effectively and productively.
c. troubleshoot systems and applications.
d. transfer current knowledge to learning of new technologies.

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