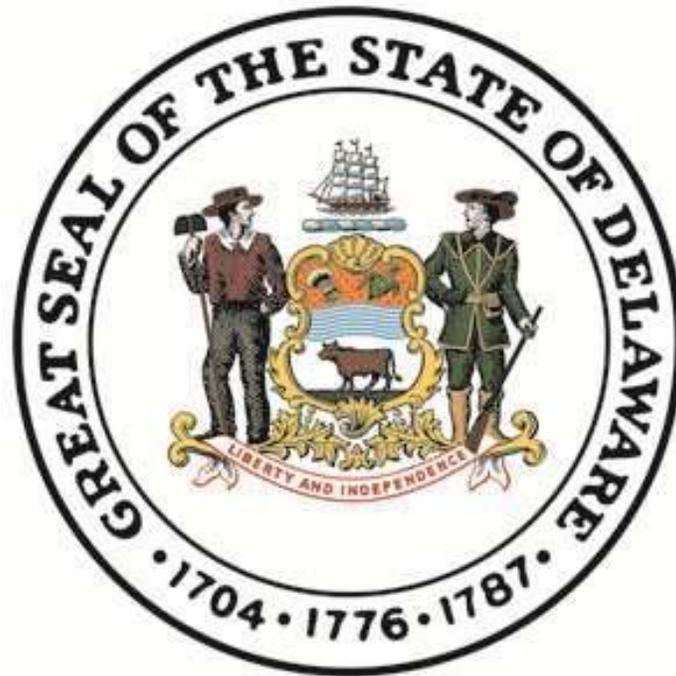


Senate Concurrent Resolution #22: Task Force on State Educational Technology

Final Report to the 148th General Assembly



March 30, 2016

*A report of findings and recommendations regarding
State Educational Technology in Delaware public schools.*

TASK FORCE ON STATE EDUCATIONAL TECHNOLOGY

Michael Watson, Chair

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March 30, 2016

To: Chair and members, Bond Committee
Chair and members, Joint Finance Committee
Chair and members, House Education Committee
Chair and members, Senate Education Committee

In early 2015, the Senate Concurrent Resolution No. 22 directed that a Task Force be formed to conduct a study on educational technology and update the state educational technology plan to ensure that all Delaware students have access to modern and effective educational technologies that enhance learning and promote college and career readiness. The Task Force on State Educational Technology has spent the past nine months working to fulfill the requirements of this resolution. We are pleased to present the results of those efforts through this report.

Thank you for the opportunity to serve our State and contribute to improving education through the use of technology for our Delaware students. We trust you will find this report useful in addressing the technology and education needs of our students, teachers, administrators, and schools.

On behalf of the Task Force, I hereby submit this report for your consideration.

Sincerely,



Michael Watson, Chairperson

Task Force Members

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Patricia Dallas
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Steven Mancini
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Dr. Dusty Blakey
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Overview of the Report and Planning Process

The Task Force on State Educational Technology was formed by Senate Concurrent Resolution No. 22 by the 148th General Assembly of the State of Delaware (Appendix A) to study educational technology and update the state educational technology plan to ensure that all Delaware students have access to modern and effective educational and assistive technologies that enhance learning and promote college and career readiness.

The Task Force's initial meeting was Thursday, July 9, 2015. The Task Force members reviewed national reports on educational technology and decided that there were three over-arching areas that needed to be considered in the plan: Infrastructure and Leadership, Teaching and Learning, and Assistive Technology. The Task Force formed sub-committees related to each of these three areas.

During the fall of 2015, the Task Force conducted two surveys related to the current use of educational technology in our schools and classrooms and the readiness of teachers to teach using educational technology. The "teacher" survey (Appendix B) was used to determine use of technology in our schools and teacher attitudes. The "infrastructure" survey (Appendix C) was used to determine broadband issues and access related to infrastructure at the LEA (Local Education Agency – includes districts and charters) level.

The Task Force, as a whole and as the three sub-committees, met regularly between July 2015 and March 2016 reviewing national reports and activities, previous strategic plans from the Delaware Center for Educational Technology, reports from other states, survey data from the teacher and infrastructure surveys, and other discussions and documentation that provided a current status of educational technology in Delaware schools.

This report is organized around these three areas and presents first, a national perspective, then the perspective of where Delaware has been, where we are now, and where we need to go. The national and Delaware perspectives lead to the goals and their associated strategies, and recommendations made in this report. Some of the recommendations have budget ramifications and some have to do with policy, procedures, and activities.

The Task Force firmly believes that Delaware needs to provide an educational environment integrated with technology that aligns with the needs of students as they prepare for being college and career ready. The Task Force believes that the result of this technology-rich environment will be an education infrastructure and teaching and learning ecosystem that will provide the appropriate tools, resources and support for Delaware's hard-working educators and students and will be able to grow and progress so that the students thrive and contribute positively to Delaware's economy and culture.

In summary, the Task Force reviewed technology use in our public education schools and classrooms and has made goals, strategies, and associated recommendations (Appendix E) through this report. This Task Force report will be submitted to the Chair and members of the Bond Committee, the Joint Finance Committee and the House and Senate Education Committees of the 148th General Assembly by March 30, 2016.

Task Force Members

- Michael Watson, Chair – Chief Academic Officer/Associate Secretary of Education, Delaware Department of Education
- Dr. Ted Ammann – Assist. Superintendent, Red Clay Consolidated School District
- Dr. Dusty Blakey – Superintendent, Colonial School District
- Dr. Michele Brewer – Assistant Professor, Technology Chair, Wilmington University
- Patricia Dallas – Teacher, Red Clay Consolidated School District
- Representative Tim Dukes – House Education Committee
- Dr. Kevin Fitzgerald – Superintendent, Caesar Rodney School District
- Robert Fulton – Superintendent, Cape Henlopen School District
- Colleen Gause – Telecommunications, Department of Technology and Information
- Kimberly Reinagel-Nietubicz – Senior Legislative Analyst, Office of Controller General
- Matthew Korobkin – Special Education Officer, Delaware Department of Education
- Michael League – Instructional Technology Coach, Indian River School District
- Elizabeth Lewis – Senior Fiscal & Policy Analyst, Office of Management and Budget
- Patrick Liberato – Technology Coordinator, Charter School of Wilmington
- Steven Mancini – Supervisor, Inform. & Inst. Technology, New Castle County Vo-Tech
- Dr. Beth Mineo – Director, Center for Disabilities Studies, University of Delaware
- Randy Reynolds – Information Technology Supervisor, Cape Henlopen School District
- Megan Szabo – Delaware's 2015 Teacher of the Year, Caesar Rodney School District
- Senator Bryan Townsend – Senate Education Committee

Other contributors to this work include:

- Dr. Wayne Hartschuh – DCET Executive Director, Delaware Department of Education
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Executive Summary

Technology has increasingly transformed the way people live their lives, influencing such aspects as communication, artistic endeavors, and methods of teaching and learning. Education across the nation is struggling to keep up with the needs of companies hiring its graduates, colleges and universities having higher expectations and possibly most important, struggling to keep up with the needs of its “clients,” the children in the education system. Students growing up in a technologically infused culture learn differently, interact differently and engage with technology daily in all aspects of their lives.

As educators continually strive to find the best ways to connect with today’s digital learners, they search for innovative ways to integrate new technologies as part of that process in efforts to increase student achievement, shrink accessibility gaps, and prepare students for a global economy. Technology, when integrated effectively into teaching and learning, can be a powerful tool that extends learning beyond the classroom walls. We must recognize and support technology as an essential component in engaging all students more fully in learning.

To that end, the Delaware 148th General Assembly passed Senate Concurrent Resolution No. 22 calling for the establishment of a task force to study state educational technology and update the state educational technology plan to ensure that all Delaware students have access to modern and effective educational technologies that enhance learning and promote college and career readiness.

While the Task Force has followed the directive from the General Assembly to update the state educational technology plan, it has put its focus less on the technology and more on what the technology can bring in the teaching and learning process. Thus the Task Force has kept the Delaware students and the entire education enterprise top of mind in its work because technology no longer can be viewed as an isolated silo. Instead, technology infuses every part of education. The plan has been crafted with the intent to be inextricably linked to broader state plans and in coordination with the Delaware Department of Education’s comprehensive review of the delivery of special education services, including assistive technology.

Because recent studies purport that the three biggest barriers to technology adoption are the lack of leadership support, lack of financial support for training and infrastructure, and lack of quality professional development, the Task Force addressed infrastructure and leadership, teaching and learning, and assistive technology throughout the state as the foci for the plan.

Infrastructure and Leadership

Infrastructure is defined as all aspects of the network that connects students, teachers, and administrators to a vast array of resources on the Internet and people worldwide. It also includes the personnel at the state and in the LEAs to ensure that the networks continue to operate efficiently and effectively. Two decades ago when Delaware was a leader among states in many aspects of technology-related education by creating a K-12 network, infrastructure meant a connection from the Internet to the school, connections among schools and a wired connection to each classroom. With a growing reliance in schools today on mobile devices, such as laptops and tablets, wired connections within schools are no longer nearly as practical. Wi-Fi is required. In addition, because of the accelerating demand for access to broadband and the rich resources it can bring, the state needs to provide

ongoing expansion and updating of the network to catch up with the demand of teachers and students as they solve real-world problems and create content as well as use content. The increasing sophistication of the networks demands sufficient technical support in every LEA to ensure the networks are running efficiently and time and money does not go to waste because of a broken connection or other technical problem. Currently the state has a ratio of one technical support person for every 733 computers used for instruction, while the standard for business is one technical support person to every 150 devices. This lack of technical support endangers the investment in technology as well as learning for students. Finally, “the homework gap,” students without broadband access at home, is a problem for many Delaware students. This homework gap disproportionately impacts rural, western Kent and Sussex counties with some estimates suggesting that as high as 40% of families living in these areas may not currently have a path to secure broadband service.

Delaware was one of the first states in the nation to focus on educational technology by providing statewide leadership when the Legislature formed the Delaware Center for Educational Technology at the recommendation of Governor Thomas R. Carper in 1995. That leadership has become bifurcated, resulting in a diminished capacity to lead and support LEAs as they seek to provide the best education for their students. In each of these areas, Delaware needs to reclaim its prior leadership. The following goals, if accomplished, will take a major step to placing Delaware in a leading position in the country:

- **Goal 1 – Leadership:** *The state will have an oversight organization to provide strategic guidance for educational technology for the state and LEAs.*
- **Goal 2 – Broadband and Support:** *The statewide network core that provides and supports broadband access and internal networks to all Delaware public schools will be maintained and grown by providing continuous improvement and expansion of the infrastructure to meet the needs of the education community.*

Teaching and Learning

The ideal and most effective and efficient scenario for Delaware students is for every student to have a fully functioning device at school and at home, a robust connection to the Internet, devices and connections that work all the time, and most importantly, a highly engaged teacher equipped with the skills and knowledge to effectively and purposefully integrate technology into learning. While this scenario may seem lofty and difficult to reach in education, it is the norm for virtually every business in the state. It is not too much to expect that in the middle of the second decade of the 21st century, students and teachers have the same fundamental tools to ensure Delaware students are ready for the workforce and to be fully functioning citizens of the state and the nation.

The 2015-2016 Annual Delaware School Technology Survey shows approximately 110,700 devices for instruction in Delaware schools. With approximately 135,000 Delaware students, the state is not near 1 student per device and with 34,500 of the devices in computer labs or Library/Media Centers, and others on carts, it is reasonable to assume only a small percentage of them are going home with students. The scenario other businesses operate with – each employee has at least one well-supported computing device connected to the Internet – is far from reality for Delaware students. LEAs need additional support to ensure their students have the capability to access all the resources necessary to become college and career ready.

The notion of well-prepared, effective teachers has always been at the core of learning for students. With the change in student standards, approaches to assessment, instructional approaches to enable students to learn the standards as well as the influx of technology through schools, the need for high quality professional learning has never been greater.

Teacher preparation programs have responsibility to prepare teachers in a wide range of areas in a short period of time. Similarly, ongoing professional development for practicing teachers must mirror the needs of today's digital learners. As technological change has flowed through society and less rapidly through Pre-K – 12 education, teaching about the integration of technology throughout teaching and learning has been slow to permeate teacher preparation programs. As a result, many teachers responding to the survey administered in late fall 2015 feel ill-prepared to use technology effectively and are craving professional learning to help them. The following goals, if accomplished, will take a major step to ensuring Delaware students have the tools they need for full engagement in their learning and Delaware teachers have the ongoing support to keep up to date with the latest instructional methods and resources to help their students learn effectively and efficiently:

- **Goal 3 – Computing Devices:** *By the 2019-2020 school year, all students will have access to a computing device at school and at home, to enhance learning and provide them with technology skills and savvy.*
- **Goal 4 – Teacher Preparation:** *By 2020, all students graduating teacher preparation programs in Delaware will be confident and effective in using technology to enhance students' learning experiences as illustrated by the ISTE Standards for Teachers.*
- **Goal 5 – Professional Learning:** *Practicing educators in Delaware will be confident and effective in integrating technology to enhance students' learning experiences as illustrated by the Interstate Teacher Assessment and Support Consortium (InTASC) and the ISTE Standards for Teachers and consistent with PSB Regulations 1598 and 1599 and following.*
- **Goal 6 – Blended Learning to Personalize Instruction:** *Students and educators will have access to a statewide online virtual network that will include digital resources and data analysis capabilities to deliver blended learning to personalize instruction for students.*

Assistive Technology

In Delaware, assistive technology (AT) consideration, access and use is quite uneven across LEAs, and even from school to school and classroom to classroom. Other than a reiteration of the federal requirements regarding AT in the *Delaware Administrative Manual for Special Education Services*, the Delaware Department of Education has issued no additional guidance to LEAs regarding AT consideration, access and use. As evidenced in data collected at many junctures, education personnel feel ill equipped to meet their AT-related obligations to students because of confusion regarding roles and responsibilities, consideration and evaluation processes, and acquisition mechanisms (including funding issues).

Tremendous barriers to AT access arise from the perceived lack of funding for AT. Personnel are implicitly and explicitly urged to avoid consideration of AT for fear of the fiscal implications, and there seems to be very limited awareness of how to maximize multiple sources of financial support for AT access.

In many instances, the requirement to consider AT for all students for whom an IEP is developed is ignored, and the deployment of AT expertise across LEAs is quite uneven.

Some LEAs have dedicated AT Specialists on staff that support team decision-making and assist educators in implementing AT effectively. Other LEAs have no formalized mechanisms – and the personnel who support their implementation – relative to AT access, despite the clear mandates for AT access and use in IDEA. The following goals, if accomplished, will ensure that all students have access to the devices necessary for their learning and all teachers have the knowledge and expertise necessary to use their tools appropriately:

- **Goal 7 - Assistive Technology: Student:** *Ensure all students, including students with disabilities, will have access to technology that will help them learn and achieve.*
- **Goal 8 - Assistive Technology: Educators:** *All educators will have sufficient knowledge, skills, and dispositions—as well as access to consistent and predictable acquisition mechanisms—to ensure that students with disabilities have access to the AT needed for engagement, learning and skill demonstration.*

Funding

Each of the eight goals has multiple strategies that in turn lead to recommendations, some of which have budget ramifications and some of which have to do with policy, procedures, and activities. Goals, strategies and recommendations are included in each section and summarized in Appendix E.

The Task Force firmly believes that Delaware needs to provide an educational environment integrated with technology that aligns with the needs of students as they progress down the path to being college and career ready. If Delaware is serious about creating an educational environment that matches the needs of students who are constantly engaged with technology outside the school, students whose paths to careers, whether through college or directly into careers, are more rigorous and truly different from paths of earlier generations, then the state should adopt, implement and fund the goals, strategies and recommendations.

Not all goals, strategies, and recommendations have direct budget implications, but those that do must be addressed. There must be consistent, dedicated funding streams to address:

- the network core, broadband access, Internet access and associated services as provided by the Department of Technology and Information;
- internal school networks, including wireless access, to achieve a 5–7 year replacement cycle;
- a technology allocation fund that can be used to purchase or lease computing devices, provide technical support, and provide for professional learning for educators;
- the matching provisions of the Technology Block Grant for technology support;
- the expansion and growth of eLearning Delaware;
- a statewide repository for instructional resources;
- the per student cost of the learning management system for K-12 student use; and
- assistive technology for students with disabilities.

Budget Recommendation Summary

FY17	Amount	Purpose
Budget Recommendation 1	\$3,000.0	Increases the bandwidth of elementary schools to 100 Mbps and all secondary schools to 1 Gbps and associated core services at DTI*
Budget Recommendation 5	No Cost	Changes Epilogue language for the Technology Block Grant (FY16 Epilogue Section 344) to include "instructional personnel"
Budget Recommendation 6	\$1,000.0	Increases Technology Block Grant*
Budget Recommendation 11	\$48.0	Increases the budget for the Learning Management System to accommodate additional student participation**
FY18	Amount	Purpose
Budget Recommendation 2	\$1,200.0	Increases bandwidth for all schools to 1 Gbps and associated core services at DTI to align with the FCC/SETDA guidelines for 2017-2018
Budget Recommendation 3/4	\$1,250.0	Establishes an E-rate Category 2 funding stream
Budget Recommendation 7	\$2,650.0	Moves existing funding for assessment computers to Technology Block Grant
Budget Recommendation 8	\$1,000.0	Increases Technology Block Grant (minimum amount)
Budget Recommendation 9	No Cost	Adjusts the matching provision for technology support in the Technology Block Grant so the match is against the block grant rather than the FY98 match
Budget Recommendation 10	\$500.0	Increases funding for eLearning Delaware (DDOE) to support online professional learning, collaboration opportunities, and a statewide repository for instructional resources
Budget Recommendation 12	TBD – Fall 2016	Increases funding for assistive technology based upon DDOE's comprehensive review of the delivery of special education services, including assistive technology, per FY15 Epilogue Section 307
FY19	Amount	Purpose
Budget Recommendation 8	\$1,000.0	Increases Technology Block Grant (minimum amount)
Budget Recommendation 10	\$250.0	Increases funding for eLearning Delaware (DDOE) to support online professional learning, collaboration opportunities, and a statewide repository for instructional resources

* Included in DDOE's submitted budget request for FY17 and included in the *Governor's Recommended Budget* within DTI.

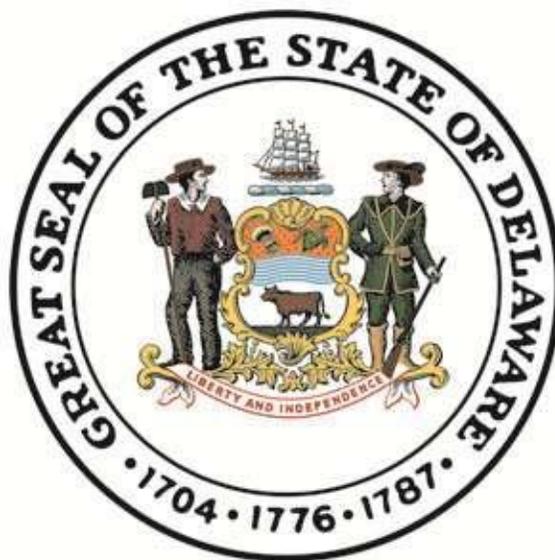
** Included in DDOE's submitted budget request for FY17 with \$30.0 included in the *Governor's Recommended Budget* for actual costs. \$18.0 for additional student participation not included.

The Task Force believes that the result will be an education infrastructure and teaching and learning ecosystem that will be able to grow and progress with the needs of all students in the state. The resultant ecosystem will provide the appropriate tools, resources and support for Delaware's hard-working educators and students so that the students thrive and they contribute positively to Delaware's economy and culture.

Task Force on State Educational Technology

**A Report to the 148th General Assembly
on the**

State Educational Technology Plan



March 30, 2016

Introduction

Technology has increasingly transformed the way people live their lives, influencing such aspects as communication, artistic endeavors, and methods of teaching and learning. Education across the nation is struggling to keep up with the needs of companies hiring its graduates, colleges and universities having higher expectations and possibly most important, struggling to keep up with the needs of its “clients,” the children in the education system. This struggle is due, in large part, to the fact that technological innovation in the past half century has virtually impacted all sectors of the U.S. economy at an increasing pace. As a result, employers are requiring new skill sets from today’s graduates. Colleges are adjusting to employers’ needs as well as other needs of students, thus creating different expectations for high school graduates. Students growing up in a technologically infused culture learn differently, interact differently and engage with technology daily in all aspects of their lives.

As educators continually strive to find the best ways to connect with today’s digital learners, they search for innovative ways to integrate new technologies as part of that process in efforts to increase student achievement, shrink accessibility gaps, and prepare students for a global economy. Technology, when integrated effectively into teaching and learning, can be a powerful tool that extends learning beyond the classroom walls. The educational landscape in Delaware now includes; podcasting, blogging, videoconferencing, blended learning, and personalized learning, and as such, we must recognize and support technology as an essential component in engaging all students more fully in learning.

In 1997, when the first Delaware Center for Educational Technology (DCET) Strategic Plan (FY1997-FY1999) was written, computers were scarce in our schools, not all classrooms were wired for the Internet, and laptops were bulky and expensive. The DCET vision of “The First State in Education: Every Classroom, Every Teacher, Every Child” established the commitment “to help empower children, through the use of information technology, to achieve higher standards in education.” [1] Although Delaware has been touted as a leader in the nation for many of our technology efforts, which has led to multiple accolades, *there is still much work to be done.*

Today, students and teachers are embracing new technologies at a rapid pace and are comfortable using it in their daily lives. To that end, the Delaware 148th General Assembly passed Senate Concurrent Resolution No. 22 calling for the establishment of a task force to study state educational technology and update the state educational technology plan.

While the Task Force has followed the directive from the General Assembly to update the state educational technology plan, it has put its focus less on the technology and more on what the technology can bring in the teaching and learning process. Thus the Task Force has kept the Delaware students and the entire education enterprise top of mind in its work because technology be no longer be viewed as an isolated silo. Instead, technology infuses every part of education. To that end, the plan has been crafted with the intent to be inextricably linked to broader state plans and in coordination with the Delaware Department of Education’s comprehensive review of the delivery of special education services, including assistive technology.

This plan focuses on technology’s role in Infrastructure and Leadership, Teaching and Learning, and Assistive Technology from both the national and Delaware perspectives leading to strategies to accomplish goals in each of those areas. The strategies lead to

recommendations, some of which have budget ramifications and some of which have to do with policy, procedures, and activities.

The way we educate students today must keep pace with an ever changing interconnected society and Delaware must position itself to do just that. A growing body of research finds that, under the right circumstances, the adoption of new technologies will spread by diffusion. Recent studies purport that the three biggest barriers to technology adoption are the lack of leadership support, lack of financial support for training and infrastructure, and lack of quality professional development. A closer look at the current educational landscape in Delaware highlights the need to address infrastructure and leadership, teaching and learning, and assistive technology throughout the state. Following are key major trends and developments affecting current and future Delaware students and educators.

Infrastructure and Leadership

National Perspective

Infrastructure is defined as all aspects of the network that connects students, teachers, and administrators to a vast array of resources on the Internet and people worldwide and the personnel to ensure that the networks continue to operate efficiently and effectively. Just as there is an underlying structure carrying water from a reservoir through a cleaning and filtering system underground to a home and through pipes to a faucet enabling a glass of water to drink, so too a technological infrastructure leading from the Internet to the LEA to the school to a student's desktop is crucial to access the resources necessary to learn and teach in the 21st century. Leadership is the linchpin between the technology and teaching and learning and assistive technology. Without the commitment of school, district, state and national leadership to the effective and efficient use of technology in schools and ensuring all educators are prepared and equally committed to using that technology, enormous monetary investments of taxpayer money can and will be squandered.

Bandwidth and Wi-Fi

Nationally, an education infrastructure was accelerated by the creation of the E-rate program. The E-rate program ('E' stands for education) was formed by the Telecommunications Act of 1998 to provide discounts to schools and libraries for telecommunication services. The E-rate, the third largest federal education program, had an early goal of connecting all schools to the Internet. Over a few short years, the demand for bandwidth in education has doubled every two to three years. Since 2013, the Federal Communications Commission (FCC) expanded the size of the E-rate program by 60% - from \$1.5 billion a year to \$3.9 billion a year - and increased a focus on wireless (Wi-Fi) within the schools in an attempt to ensure each computing device in a school, not just each school, could reach the Internet. This first major overhaul of the program in 17 years, dubbed "E-rate Modernization," took place to emphasize broadband access and provide for more equitable use of funds for internal broadband connections including wireless. [2]

The goal of this increase in support, in addition to efforts to make the program more transparent, streamlined and easy to use, is to ensure that neither broadband access to the schools nor the distribution of signals within a building will be a hindrance to educators and students accessing the incredible array of resources on the Internet or communicating with

their peers around the world. That goal will not be reached without substantial effort on the part of states and LEAs.

However, many students still lack access at home, a condition that FCC Commissioner Jessica Rosenworcel has named “the homework gap.”^[3] According to the Pew Center, approximately one third of households with school-aged children and incomes below \$50,000 in the country do not have high-speed broadband at home, and this low-income group makes up about 40% of all families with school-aged children.^[4] Project Tomorrow, a not-for profit organization, has been surveying students, teachers and parents regarding their attitudes about, and use of, technology for 13 years. In this year’s survey, they asked teachers, “Agree or Disagree: I am sometimes reluctant to assign digitally-based or Internet required homework or projects to my class since some of my students may not have safe, consistent access to the Internet outside of school.” The results are below in Table 1.^[5]

Response	National percentage
Strongly disagree	5%
Disagree	8%
Neither agree or disagree	18%
Agree	33%
Strongly agree	35%

More than two-thirds of this sample of the nation’s teachers has to alter their plans to help students learn because of concern regarding students’ access to resources outside of school.

There are a few efforts on a national level to alleviate the homework gap. For example, in action taken in June 2015, the FCC voted to include broadband connections in a \$1.8 billion federal program that subsidizes telephone services for low-income people.^[6] In addition, the Department of Housing and Urban Development is leading a small effort in 28 communities to increase Internet access for low-income families, and the private sector, in response to prodding from the FCC, launched Connect2Compete in 2011.^[7] This program, offered in partnership with major cable providers, offers Internet service for as low as \$9.95 a month and low-cost devices as well to students and families that qualify for the National School Lunch Program. However, the real solution to the homework gap will be at the state and local levels, working closely with telecommunications providers and local businesses to recognize the demand and need for sufficient bandwidth for everyone in the community.

Federal Leadership

The U.S. Department of Education established an Office of Educational Technology (OET) as a part of the Office of the Secretary of Education during the Clinton Administration. Current initiatives from the Office include the ConnectED program to help schools get connected to broadband Internet; working to ensure there is equal access to technology and instructional materials for all students, including students with disabilities, regardless of race, color or national origin; encouraging the use of openly licensed educational resources or OER; advocating for and providing professional learning; working to ensure the protection of privacy and security for students, educators and all involved in schools; and striving “to be

on the nexus of transformative research and the curators (of) innovative events to serve an impactful resource to the evolving system.” The OET also has worked throughout the Department to assist in understanding how technology can further the goals of other Offices and worked across agencies such as the Federal Communications Commission when it developed the National Broadband Plan.

The Office was also responsible for creating the 2016 National Education Technology Plan, *Future Ready Learning: Reimagining the Role of Technology in Education*.^[8] The plan has sections on Learning, Teaching, Leadership, Assessment and Infrastructure with a goal and recommendations in each section. Those goals are:

- *Learning*: All learners will have engaging and empowering learning experiences in both formal and informal settings that prepare them to be active, creative, knowledgeable, and ethical participants in our globally connected society.
- *Teaching*: Educators will be supported by technology that connects them to people, data, content, resources, expertise, and learning experiences that can empower and inspire them to provide more effective teaching for all learners.
- *Leadership*: Embed an understanding of technology-enabled education within the roles and responsibilities of education leaders at all levels and set state, regional, and local visions for technology in learning.
- *Assessment*: At all levels, our education system will leverage the power of technology to measure what matters and use assessment data to improve learning.
- *Infrastructure*: All students and educators will have access to a robust and comprehensive infrastructure when and where they need it for learning.^[9]

Delaware Perspective

While Delaware was a leader among states in many aspects of technology-related education in the past, especially in connecting schools and classrooms by creating a K-12 network in 1997, Delaware is no longer in the vanguard. Because of the accelerating demand for access to broadband and the rich resources it can bring, the state needs to provide ongoing expansion and updating of the network. Delaware also was one of the first states in the nation to focus on educational technology by providing statewide leadership when the Legislature formed the Delaware Center for Educational Technology at the recommendation of Governor Thomas R. Carper in 1995. That leadership has become bifurcated, resulting in a diminished capacity to lead and support LEAs as they seek to provide the best education for their students.

There are a number of elements to infrastructure, and all of them are necessary for teachers and students to integrate technology throughout the teaching and learning process to engage students and ensure they are ready for college and careers. Two key elements are connections from the students’ and teachers’ computing devices through to the Internet, and technical support to ensure the devices and all the connections are working well. Another factor, professional learning and other assistance for educators to help them have the instructional and management support necessary to be successful integrating technology into learning, is addressed in the Teaching and Learning section.

Bandwidth and Wi-Fi

In 1994, Delaware, through the Office of Information Services (now the Department of Technology and Information) created the K-12 Delaware Education Network (DEN) with the result being that Internet access became the standard rather than the exception throughout Delaware's public schools. More specifically, beginning in 1996, the Delaware Center for Educational Technology (DCET) wired every single public school classroom with voice, data, coaxial, and fiber optics cable with at least one data port fully connected to the Delaware Education Network (DEN) and the Internet with a T1 line (1.4Mbps) to each school. This effort made Delaware the first state in the nation to have Internet and wide area network access in every public school classroom. For the state's efforts, the DCET was awarded a Computerworld Smithsonian Award for Classroom Networking in 1998. The DCET then purchased servers for the statewide pupil accounting system, upgraded the local area network (LAN) electronics (hubs and switches) in the schools, and implemented the CATV/Video Broadcast Project so schools could broadcast a cable television and multiple video signals to every classroom.

The Delaware Department of Technology and Information (DTI) – Engineering & Telecommunications has continued this work since 2003 by supporting the K-12 network, including managing the local networks in every participating K-12 school and the overall K-12 wide area network, managing all of the switches and routers in each school, providing filtered Internet connectivity to each school, managing the firewalls that protect this network and a host of other services related to security and antivirus protection. Additional support services include providing secure access to the state network, list services for distributed messaging and a 24/7 service desk for issue management and outage resolution.

Within the last five years, DTI has provided three major upgrades and enhancements to the K-12 network – an upgrading of aging switches, the implementation of an e-mail solution, and an upgrade of the videoconferencing core services.

According to Education Superhighway (ESH), a national not-for-profit organization that is focused on upgrading Internet access in every classroom in the U.S., Delaware is doing rather well with its connectivity compared to other states, yet it still has a way to go to ensure all students have access to the tools and resources important to ensure they are college and career ready. ^[10] One measure ESH uses is the percentage of schools that are ready for digital learning today, measured by the number of schools that have a minimum of 100 kbps per student, a standard recommended by the State Educational Technology Directors Association (SETDA) and incorporated into the goals of the FCC's E-rate modernization program. ^[11] By that measure, only 52% of the Delaware schools have reached the minimum goal established by SETDA and the FCC for the 2014-2015 school year. Another measure is whether or not a school has the fiber connections needed to meet bandwidth targets, and because of the state's previous efforts, 100% of the schools have fiber.

Other measures of bandwidth were captured in a survey of LEAs taken in late fall 2015 regarding their infrastructures. One question addressed the need to connect student and teacher devices to wireless (Wi-Fi) in order to ensure they have ubiquitous access wherever they are on a campus. The results from the survey show a substantial need.

Percent of Devices	Percent of LEAs
0% - 10%	0%
11% - 25%	0%
26% - 50%	22%
51% - 75%	41%
76% - 100%	38%

Although some LEAs may connect their devices through hard wires, more and more prefer the cost-savings and flexibility provided by wireless, especially as more and more portable devices are used in schools.

With E-rate modernization, there is a tremendous opportunity to upgrade the internal telecommunications infrastructure, including wireless, of Delaware schools with the support of E-rate Category 2 funds at great cost savings. With E-rate Category 2 services, each school can request up to \$150 per student over a 5-year period. Using E-rate discount data and student enrollment for the 2015-2016 school year, there were 135,152 students which means our schools can request over \$20 million (\$20,272.8) in E-rate Category 2 services that will be discounted by \$14,604.5 (72.04%) with the balance, over the five-year funding cycle, of \$5,668.3 being the responsibility of the schools.

An evaluation of E-rate applications for the 2015-2016 school year shows that only nine districts and four charters applied for Category 2 funds in the first year of the five-year cycle. Discussions with the LEAs concerning E-rate applications for the 2016-2017 school year resulted in eight districts and four charters intending to file. This gives a total of 13 districts (some districts are filing in both years) and eight charter schools in the first two years – less than half of our LEAs. There is a variety of reasons why less than half have applied, but time and effort, understanding the program and process, recent upgrades (and realizing that they have five years to access E-rate funds), and lack of funds for the school share head the list. Currently, this entire cost falls on the LEAs even though traditionally the state has supported the telecommunications infrastructure.

Additional savings could be generated by a statewide RFP for wireless services and potentially DTI overseeing the statewide wireless infrastructure. The infrastructure survey asked, “Would your LEA consider participating in a statewide RFP and associated award with the intent of reducing costs of wireless access in your school(s)?” Eighty-four percent of the respondents said they would consider participating in the statewide RFP.

A crucial element in making sure students and teachers can access the Internet is ensuring the network is working effectively and efficiently, and that takes skilled technicians. Like most states, Delaware is challenged to provide appropriate technical support across all LEAs.

The infrastructure survey conducted by the Task Force gleaned the equivalent of approximately 150 full time technical support personnel across our LEAs. These personnel support instructional and administrative computing devices (computers and tablets), servers, wired and wireless networks, interactive whiteboards, audio enhancements systems, printers, and a variety of other technologies. Just looking at the approximately 110,000 instructional computing devices in our schools, the ratio of instructional computing

devices to support personnel is approximately 733 to 1. The standard for business is at least one technology support person per 150 devices. While education currently cannot afford such an investment, the paucity of technology support jeopardizes not only LEAs' investments in the technology itself, but more important, students' learning.

In 2014, a study by BroadbandNow.com ^[12] and others estimated that 16% of Delaware residents qualified as underserved for broadband services because either broadband service was not available or the cost of broadband was considered above a reasonable market price. Since that time Delaware has experienced broadband expansion in some areas, but obstacles to adoption, including cost and digital literacy have shown no improvement. This homework gap disproportionately impacts rural, western Kent and Sussex counties with some estimates suggesting that as high as 40% of families living in these areas may not currently have a path to secure broadband service.

Leadership

The Delaware Center for Educational Technology (DCET) was formed as a result of recommendations made by the Educational Technology Committee in a report titled "Educational Technology: A Report to the Governor, Legislature, and Citizens of Delaware" dated February 1995. The committee was established in 1994 by House Joint Resolution No. 27. There were 29 specific recommendations that were summarized into seven key strategies in the report:

- Create the Delaware Center for Educational Technology as the operating and support organization for the education network.
- Establish a Delaware Education Network and ensure equal access to and equity in the network.
- Wire every classroom and provide computing resources by 1997.
- Train teachers, librarians, and school administrators in the application and use of technology.
- Identify costs, secure funding, and provide appropriate technological resources for the schools.
- Promote the activities of the Center to the benefit of the educational community and in support of the economic development objectives of the State.
- Collaborate and partner with public libraries, nonpublic schools, and the business community.

In the spring of 1995, the Delaware Legislature accepted the recommendation of Governor Thomas R. Carper to establish the Delaware Center for Educational Technology (DCET). The Center is intended to create a modern educational technology infrastructure in Delaware's public schools for the purpose of enabling students, through the use of educational technology to meet the academic standards set by the State Board of Education and to develop the skills needed by a world-class work force.

The Delaware Center for Educational Technology was governed by a ten-member Board consisting of three members who had expertise in the field of computer information, three public school superintendents, two public school teachers, the State Superintendent or his designee, and the Executive Director of the Office of Information Systems. The State Librarian, the State Budget Director, Controller General, Secretary of Finance or their designees, and one representative designated by each of the Presidents of the three

Delaware public institutions of higher education, were ex-officio, non-voting members of the Board. The DCET Operations officially began on February 1, 1996 with the hiring of the Executive Director.

In a very short period of time, Delaware leaped from being technology poor in education to building a solid foundation for growth in educational technology.

The DCET launched a number of projects over the past nearly two decades. The first was the classroom networking project, in which (as noted above) every public school classroom was wired with voice, data, coaxial, and fiber optics cable with at least one data port fully connected to the Delaware Education Network (DEN) and the Internet.

After the completion of the wiring project, DCET implemented the Server and Infrastructure Enhancement Project and the CATV / Video Broadcast Project. The Server and Infrastructure Enhancement Project allowed DCET to purchase the servers for the statewide pupil accounting system, ensure an instructional server in every school, and begin to upgrade the LAN electronics in the schools. The CATV / Video Broadcast Project ensured the schools could broadcast a cable television and multiple video signals to every classroom. The goal for these upgrades was to save LEAs both time and money, whether by cutting down on travel expenses by conducting meetings through the videoconferencing system or using the power of volume purchasing for e-mail services or expanding the speed and efficiency of the overall K-12 network through better, more up-to-date switches. In addition, the Legislature provided a three-year funding stream to the districts for classroom technology that included a matching capability of using the tax base to generate funding for technology maintenance and support.

Thus in the late 1990s and early 2000s, Delaware made a tremendous commitment to make technology an important tool in the classroom by placing the roadbed for connecting Delaware public schools to the information highway. However, in 2003, the DCET was split up for operational efficiency at the state level, with the technical staff moving to the Department of Technology and Information and the education staff moving to the Delaware Department of Education and revamping the Board of Directors with an educational focus. In 2009, the DCET Board of Directors was disbanded. The potentially unanticipated side effect of this action was there was no specific leadership group for educational technology because oversight and budgeting fell to two separate organizations: DTI and DDOE. After 2003, DCET was challenged by inconsistent finances combined with the resurgence of Web applications and subscription services that place larger dependency on Internet access.

In the past 10 years, budgetary concerns have limited the growth of technology in education, unfortunately at a time when the use of technology in virtually every other aspect of our society has accelerated. We have been able to ensure that all schools have migrated from a T1 data line (1.4 Mbps) to a minimum to a 10 Mbps data line, and have implemented statewide online assessment, a feat many states are still struggling with. Our successful online assessment implementation was only possible because of Delaware's previous efforts in establishing a statewide telecommunications infrastructure and a statewide pupil accounting system.

Goals, Strategies, and Recommendations: Infrastructure and Leadership

Goal 1 – Leadership

The state will have an oversight organization to provide strategic guidance for educational technology for the state and LEAs.

Strategies

1. Form the Council on Educational Technology with the following responsibilities:
 - a. Needs Assessment – Establish a process for identifying ongoing technology and human resource needs at the classroom, campus, district and state levels, including a technology inventory.
 - b. Policy – Based upon the needs assessment and other considerations, recommend policy annually.
 - c. Budget – Recommend a budget for statewide educational technology expenditures annually.
 - d. Planning – Develop ongoing (three-year) strategic plans for the state that “mesh” with other planning efforts at the Department of Education (DDOE), the Department of Technology and Information (DTI), and other agencies and develop a framework and process for local planning that coordinates with other plans at the local level as well as the state strategic plan.
 - e. Safety and Security – Define a statewide acceptable use policy and procedures and a process to ensure all educators and students agree to the policy; ensure all LEAs are compliant with the federal regulations including the Children’s Internet Protection Act (CIPA), Children’s Online Privacy Protection Act (COPPA), and Family Educational Rights and Privacy Act (FERPA).
 - f. Procurement – Work closely with the Government Support Services to establish a focal point within education for the preparation of technology-related RFPs, vendor negotiations, and site licenses for software specific to education to optimize costs through consolidating demand.

Rationale: The Delaware Center for Educational Technology staff was re-assigned to DDOE and DTI in 2003 and the DCET Board of Directors was disbanded in 2009. The unanticipated side effect of disbanding the DCET Board of Directors was that the Administration and Legislature lost the leadership group with a unified voice to keep educational technology issues in the forefront. With the economic downturn and oversight and budgeting falling to two separate organizations with competing priorities, Delaware has fallen behind and is in the unenviable position of playing catch-up.

This is not to say that Delaware has done nothing to advance educational technology and our infrastructure since 2009. We just haven’t done enough. In 2010, our emphasis was ensuring the infrastructure was in place for online assessment, not necessarily digital learning. If all we were trying to do was support online assessment, we have a sufficient infrastructure in place. If we want to support both online assessment and digital learning, which we do, we have fallen behind.

The time has come to refocus our efforts so our students and teachers are successful by having access to technology on a daily basis. In our Delaware public schools, this starts with leadership at the state level and prioritizing to ensure that: (1) Our telecommunications infrastructure has the sufficient bandwidth for students; (2) Our students have access to computing devices; and (3) Our teachers have sufficient training to integrate technology to utilize and rely on digital learning opportunities.

Recommendation 1.1.1: *Present Legislation to form the Council on Educational Technology that will be supported with staff from the DDOE and DTI. The Council should meet quarterly and have no more than 15 members comprised of stakeholder representatives from across the state.*

Goal 2 – Broadband and Support

The statewide network core that provides and supports broadband access and internal networks to all Delaware public schools will be maintained and grown by providing continuous improvement and expansion of the infrastructure to meet the needs of the education community.

Strategies

1. Provide the necessary resources to ensure that the network core, broadband access, Internet access, and associated services provided by the Department of Technology and Information continually align with the State Educational Technology Directors Association (SETDA) recommendations from *The Broadband Imperative* that are incorporated into the Federal Communications Commission (FCC) E-rate modernization order as a goal.

Rationale: In 2010, Delaware was able to successfully implement a statewide online assessment system in a very short period of time because of previous commitments to the state’s telecommunications infrastructure and statewide pupil accounting system. At that point, all schools were upgraded from a T1 line (1.4 Mbps) to 10 Mbps and the switching infrastructure was upgraded. A half decade later, 10 Mbps still remains as the baseline funded by the state, although LEAs have the option of increasing this bandwidth at their cost creating equity issues across the state.

A 10 Mbps telecommunications line is only capable of supporting digital learning in a school with less than 100 students according to guidelines from SETDA’s *The Broadband Imperative*. The guidelines state that by the 2014-2015 school year, schools should have at least 100 Mbps per 1,000 students/staff. In other words, a school with 100-1,000 students should have a minimum of 100 Mbps to support digital learning. In the 2015-2016 school year, only 52% of Delaware schools are meeting the 2014-2015 school year guidelines for bandwidth as determined by SETDA and the FCC. The investment recommended in the plan will bring all schools in line with the SETDA/FCC guidelines.

In recognition of the growing use of broadband throughout schools, SETDA and the FCC have set recommended guidelines for the 2017-2018

school year at 1 Gbps per 1,000 students/staff. This means by 2017-2018, a school with 100-1,000 students should have a minimum of 1 Gbps (1,000Mbps) to support digital learning.

Recommendation 2.1.1: *Ensure all elementary schools have sufficient resources to support a capacity of 100 Mbps bandwidth and all middle and high schools have sufficient resources for 1 Gbps (1,000 Mbps) for the 2016-2017 school year as well as associated increases at the network core to support the bandwidth increase.*

Recommendation 2.1.2: *In FY18, provide sufficient resources to increase bandwidth in all schools to 1 Gbps (1,000 Mbps) to align to the SETDA/FCC guidelines for the 2017-2018 school year.*

Recommendation 2.1.3: *Beginning in FY19, DTI and DDOE will conduct an annual evaluation of bandwidth requirements by school and bandwidth adjusted to ensure alignment with SETDA and FCC guidelines.*

2. Ensure adequate resources so that internal school networks, including wireless access, have a replacement cycle of 5–7 years that takes advantage of the funding cycle of Category 2 of the E-rate modernization order.

Rationale: The E-rate provides a tremendous opportunity to upgrade the internal telecommunications infrastructure of Delaware schools with the support of Category 2 funds at great cost savings. With E-rate Category 2 services, each school can request up to \$150 per student over a 5-year period. Using E-rate discount data and student enrollment for the 2015-2016 school year, there were 135,152 students which means our schools can request over \$20 million (\$20,272.8) in E-rate Category 2 services that will be discounted by \$14,604.5 (72.04%) with the balance, over the five-year funding cycle, of \$5,668.3 being the responsibility of the schools.

An evaluation of E-rate applications for the 2015-2016 school year shows that only nine districts and four charters applied for Category 2 funds in the first year of the five-year cycle. Discussions with the LEAs concerning E-rate applications for the 2016-2017 school year resulted in eight districts and four charters intending to file. This gives a total of 13 districts (some districts are filing in both years) and eight charter schools in the first two years – less than half of our LEAs. There are a variety of reasons why less than half have applied, but time and effort, understanding the program and process, recent upgrades (and realizing that they have five years to access E-rate funds), and lack of funds for the school share head the list. Currently, this entire cost falls on the LEAs even though traditionally the state has supported the telecommunications infrastructure.

Additional savings could be generated by a statewide RFP for wireless services and potentially DTI overseeing the statewide wireless infrastructure. The infrastructure survey asked, “Would your LEA consider participating in a statewide RFP and associated award with the intent of reducing costs of wireless access in your school(s)?” Eighty-four percent of

the respondents said they would consider participating in the statewide RFP.

Recommendation 2.2.1: *Provide sufficient resources from the state to ensure all LEAs are able to take maximum advantage of Category 2 of the E-rate.*

Recommendation 2.2.2: *Explore the possibility of working with the Public Service Commission and the Legislature to establish a Delaware Universal Services Fund for E-rate, not unlike the Delaware Broadband Fund.*

3. Ensure that LEAs have adequate resources and trained personnel to support and maintain their devices, internal networks and broadband coming into the schools.

Rationale: In order to support this technology capacity in an ever-increasingly complex Internet and Wi-Fi environment, LEAs need to have staff member(s) trained to support the networks and devices. When LEAs were asked what they need with respect to technology, the second highest need selected was “More technical support to keep computers and applications running.” According to the Infrastructure survey, there are approximately 150 FTE supporting over 110,000 instructional computing devices plus all the networks in Delaware schools, a ratio of approximately 733 to 1. Contrast that with a ratio of 150 devices per technology support person in business today, and our LEAs are definitely lacking the capacity to fully support the computing devices needed for digital learning.

Recommendation 2.3.1: *As the state provides flexibility in funding streams, the LEAs need to determine sufficient technology staffing to support the networks and devices in the LEA, with an initial target of one FTE per 500 devices.*

4. Enter into partnerships with telecommunications providers, carriers and appropriate agencies of the state to ensure every part of the state has sufficient broadband to support students at home.

Rationale: The National Educational Technology Plan 2016 (NETP16) addresses the issue of ubiquitous connectivity for students at school and at home. To create an effective anytime, anywhere learning environment, there needs to be reliable connectivity, just like water and electricity, both in school and outside of school. The Federal Communications Commission has dubbed the lack of access at home as the homework gap.

In 2014, a study by BroadbandNow.com and others estimated that 16% of Delaware residents qualified as underserved for broadband services because either broadband service was not available or the cost of broadband was considered above a reasonable market price. Since that time Delaware has experienced broadband expansion in some areas, but obstacles to adoption, including cost and digital literacy have shown no improvement. This homework gap disproportionately impacts rural, western Kent and Sussex Counties with some estimates suggesting that as high as 40% of families living in these areas may not currently have a path to secure broadband service.

Without equitable access to broadband, teachers are hesitant to assign homework that may require access to the Internet and students are not able to access the wide range of content for their school work or to create and share content with their peers in their LEA or across the state. Steps need to be taken to ensure all students have access to the connectivity they need to follow their interests as well as their school work.

Recommendation 2.4.1: *Encourage the Council on Educational Technology to form a working group to further delve into the best path forward to ensure robust broadband connectivity in the community and homes.*

Teaching and Learning

National Perspective

In the area of teaching and learning, changes have been driven by the desire for higher expectations for students as evidenced by the adoption of the Common Core State Standards as well as new approaches to measuring the extent to which students are attaining those standards through online assessments. Instructional materials, for so long dominated by textbooks, also are morphing because of technology. More and more, teachers have access to an increasing range of content to engage and enlighten their students because of access to a plethora of information on the Internet. Finally, new standards and ways of assessment, coupled with the influx of technology are changing the ways students and teachers interact and how they spend their time together and apart.

Common Core State Standards and Online Assessments

In June of 2010, the National Governors Association and the Council of Chief State School Officers released the final version of the Common Core State Standards (CCSS) after years of research and work. Between February 2010 and November 2011, all of the states but Alaska, Nebraska, Texas and Virginia (and only English Language Arts in Minnesota) adopted the CCSS. As a result, virtually all states, including Delaware now have more rigorous standards for students for what students need to know and be able to do in preparing ALL students for success in both college and career.

The Common Core standards and the International Society for Technology in Education (ISTE) Standards for Teachers both recognize that education as it's always been done is not enough in the digital age. They both share an emphasis on using technology, not for technology's sake, but as a tool for mastering higher-level thinking skills, focusing on research and media literacy, creativity, collaboration, problem solving, and critical thinking.

Between 2001, when Virginia began its online assessment program, and 2012, 33 states had offered some kind of substantial online testing, including Delaware. These tests were virtually all multiple-choice, automating the bubble-in answer sheets from former paper and pencil tests. The move to online assessments required additional bandwidth capabilities in schools and caused some districts to increase the number of devices they used for assessment or shuffle computers normally used for instruction into rooms that were used for online assessment during testing time. By the 2015-2016 school year, "the

majority of state-mandated end-of-year summative tests students will take will be via computer administration and not via paper-and-pencil format. In fact, only 15 percent of the over 800 tests being offered to grade 3-8 students this year will only be available in a paper-and-pencil format.” [13]

Increase and Diversity of Devices

The proliferation of technology in schools can be seen in headlines almost every day: “School district buys a computer for every student!” Seldom do the news stories delve into what students and teachers will be doing with the technology, leaving the impression in the public that what is important is the technology, not how the technology will enable learning. Thoughtful school district leaders know otherwise. They know that technology can provide teachers and students with not only a vast array of resources, but also transform the entire process of education. But the fact remains that having the devices, bandwidth and systems in place are a necessary but not sufficient aspect of the transformation of education to ensure it meets the needs of all students to be college and career ready.

Across the country there has been a significant increase in the number of devices in schools, partially due to the increasing diversity of form factors of devices. Mobile phones, tablets, Chromebooks, laptops and desktops: all are used in the teaching and learning process every day. The increase in this change is most evident in tablets and Chromebooks. The iPad was introduced in 2011 and caught fire in education as more and more applications evolved for it. Yet the emergence of the Chromebook, introduced in 2012 has been even more remarkable. Driven by low prices (\$200 - \$250), ease of use and maintenance and easy integration with Google systems, Chromebooks have moved from making up less than 1% of all devices sold to school districts in 2012 to 40% of devices sold to school districts in the third quarter of 2014 and 51% of devices sold in the third quarter of 2015 according to a report from Futuresource Consulting. [14]

The growth of online assessment is another factor that has driven additional devices in the classroom. And, finally, the phasing out of old systems, most notably Windows XP, also is driving the addition of newer devices in the classroom. Windows XP, released in 2001, had been the dominant operating system in the world and in U.S. classrooms. Data from PARCC and Smarter Balanced indicated that Windows XP was on 56% of the computers schools planned to use for the first iteration of their tests during the 2014-15 school year. Microsoft announced it would stop supporting Windows XP in April 2014. This change from Microsoft caused a surge in the purchase of new devices. [15]

Changing Approaches to Learning Enabled by Technology

With the increased availability of technology, teachers are using different instructional models and using instructional time differently. Flipped classrooms, blended learning and personalized learning all are buzzwords in the media and throughout districts. In a flipped classroom, students are rotating between face-to-face interactions with teachers and online delivery of instruction from a remote location. Blended learning, as defined by Christensen, Horn and Staker, is “a formal education program in which a student learns at least in part through online learning with some element of student control over time, place, path and/or pace and at least in part at a supervised brick-and-mortar location away from home.” [16] At least part of this definition has been picked up in the Every Student Succeeds Act, the December 2015 reauthorization of the Elementary and Secondary Education Act (ESEA). These new approaches feature more active student learning, as opposed to students

passively listening to teachers or just watching a video. Students are expected to be presented with opportunities to delve deeply into topics and solve real world problems.

These new learning approaches are enabled to a large degree by a growing shift in instructional materials from print toward digital. According to a 2014 report from MDR, approximately half of both school district curriculum and technology directors envisioned a significant shift toward digital content in the next three years. ^[17] Both Florida and North Carolina have put required digital content in policy whereby Florida has said that by the 2015-2016 school year, 50% of instructional materials funding must be spent on digital, state adopted materials. North Carolina took the ultimate step by saying that by the 2017-18 school year, districts should purchase only digital instructional materials. This shift is not confined to the mere digitization of text and access to various media; it also includes how states and districts store and distribute content. The most prevalent and fastest growing mechanism is repositories. More states – and districts - are creating repositories of digital content. At least half of the states have some form of content repository. ^[18]

The business of instructional materials also is changing, to a large degree because of technology. Teachers want more flexibility in the type of content they want to use in the classroom, the method and media of delivery as well as more flexibility in the size of content – smaller chunks in addition to full course curriculum. Open Educational Resources (OER) provide both an alternative business model and different approach to the use of instructional materials. Open Educational Resources are materials that are in the public domain or released under an intellectual property license that permits their free use and repurposing by others. They allow easy access, collaboration and sharing among educators; they are low or no cost; they often are digital; and they typically are licensed so that they can be remixed, reused, and repurposed. Some states, most notably New York, Utah and Washington, have significant OER initiatives under way that have resulted in the creation of OER content for students and teachers (New York and Utah) and an identification and vetting of OER and posting of the results (Washington). Finally the U.S. Department of Education launched an initiative called GoOpen that encourages districts to switch to OER and provides support through mentor districts, training and making certain learning management systems more accessible for OER.

Increase in Ways to Deliver Professional Learning Opportunities

The notion of well-prepared, effective teachers has always been at the core of learning for students. With the change in standards, approaches to assessment, instructional approaches to enable students to master the standards as well as the influx of technology through schools, the need for high quality professional learning has never been greater. According to the report, *Teachers' Views on Professional Development*, “a typical teacher spends about 68 hours each year on professional learning activities typically directed by districts. ^[19] When self-guided professional learning and courses are included, the annual total comes to 89 hours.” Teachers and administrators generally agree on what good professional learning looks like: relevant to their context, interactive, delivered by someone who understands the teachers' experiences, and sustained over time. Two models of delivery of professional learning that match best with these characteristics are digital literacy coaches and online delivery of professional learning.

Districts throughout the nation are employing digital literacy coaches effectively and some states, including Virginia and Pennsylvania, have implemented coaches statewide. When presented with twenty possible responses to the question in the Project Tomorrow survey,

“Which of these types of professional development formats do you think are most effective to help teachers learn how to integrate technology within instruction in their classroom,” ‘In school peer coaching and mentoring’ was the second most popular choice by teachers responding to the survey. When supported by just-in-time online videos, online Webinars and online communities of practice to allow teachers to share and collaborate, these systems are even more effective. The coaching model is just emerging from adolescence, but the lessons learned – well-trained coaches available frequently and a program that is sustained over time – are showing it to be highly effective when implemented with fidelity.

Delaware Perspective

Common Core State Standards (CCSS) and Online Assessments

Delaware adopted the Common Core State Standards (CCSS) on August 19, 2010 and has remained with the standards since that time. Delaware Governor Jack Markell, who co-chaired the NGA at that time, led the adoption process for states.

The push to change Delaware’s standards to ensure college and career ready expectations for all was needed. As a Fordham institute report in 2010 explained, Delaware’s English / Language Arts (ELA) standards were among the worst in the country, while the CCSS ELA standards were significantly superior to what our students needed to know and be able to do. In Mathematics, Delaware’s standards were considered decent, yet the CCSS math standards were also deemed superior to our existing standards.

Delaware was deemed as one of the states that has been able to implement these new college and career standards well. For example, Delaware’s Common Ground for Common Core (CGCC) training provided rigorous, year-long professional learning experience for school-based teams of educators designed to bring educators up to speed on what the Common Core standards are, the implications for day-to-day classroom instruction, and the shifts necessary to ensure the Common Core is successfully rolled out.

A recent study conducted by Harvard University on Delaware and four other states concluded that teachers in Delaware have made major changes in their lesson plans and instructional materials. With this shift, teachers and principals have largely embraced the new standards. This report also showed that teachers reported turning to a multitude of online sources. For example, more than one third of our teachers surveyed (37%) indicated that they used the Open Educational Resource tool EngageNY and almost one-fourth of teachers used LearnZillion for lesson plans aligned to Common Core. Teachers felt strongly that these sources had been valuable to them in aligning their instruction to CCSS.

Delaware began testing online in 2010 in response to educators desiring more flexible and better data than was possible with the prior system, and the state made the shift to online assessment with unprecedented speed. In the summer 2008 a task force identified two priorities for statewide tests – efficient scoring and tracking data over time. In winter of 2010 the state began readiness trainings and stakeholder meetings to broaden communications, conducted rapid field test with multiple checklists in the spring, ensured network connectivity, student information management systems and additional hardware were in place in the summer and in the fall of 2010 began the launch of the Delaware Comprehensive Assessment System (DCAS). As results began to flow to districts in the spring and summer of 2011, the state began statewide professional development on using

data from online tests. This rapid development could not have happened without commitment from all levels of state government as well as a solid statewide telecommunications network and the pupil accounting systems that already were in place.

Additional tests were added in the 2011-12 school year and by the 2012-13 school year all DCAS assessments were online with the exception of several end of course exams. In the 2014-15 school year, Delaware implemented the Smarter English Language Arts and Smarter Mathematics assessments. These tests are quite different from our legacy tests. For example, in ELA our old assessment relied heavily on multiple-choice questions measuring reading comprehension. Our new assessment requires students to write short answers and longer essays. In mathematics, our new assessment requires students to show their work and to demonstrate their mathematical reasoning, not to simply pick the correct answer.

The shift to these new assessments has reduced state testing time between 35-45% per grade level tested.

Increase and Diversity of Devices

While definitions of devices and various technologies have changed over time as the technologies themselves have changed, for the purposes of this plan, a fully functioning device is one where students can input and create content, consume content by reading, listening and viewing, and distribute content to people around the world. This includes desktop and laptop computers, Chromebooks and tablets. It does not include eReaders, portable media devices or mobile devices such as smartphones, although many would argue that a smartphone should be included.

The ideal and most effective and efficient scenario for Delaware students is for every student to have a fully functioning device at school and at home, a robust connection to the Internet, and devices and connections that work all the time. While this scenario may seem lofty and difficult to reach in education, it is the norm for virtually every business in the state. It is not too much to expect that in the middle of the second decade of the 21st century, students and teachers have the same fundamental tools to ensure Delaware students are ready for the workforce and to be fully functioning citizens of the state and the nation.

Since the 2003-2005 DCET Strategic Plan, there have been significant changes in technology in Delaware's schools. The state began an annual school technology survey in the fall 2000. In the 2000 survey, there were 30,545 instructional computers and 1,763 administrative computers. In reviewing the surveys between 2007 and the current survey, a number of facts stand out.

Types of Computing Devices Surveyed

The survey has shifted what it has asked for based upon changes in the technology used in schools. The 2007 and 2008 surveys first asked for multimedia computers in addition to Macs, Mac laptops, PCs and PC laptops, indicating recognition of the shift in power and use of the devices. As the state geared up for online assessments, the focus in the 2009 and 2010 surveys was on computers that met the Delaware Comprehensive Assessment System's recommended specifications. In 2011, the survey began collecting "Other Internet Access Devices," including Android tablet, iPad, Windows tablet, Mobile device, Portable media player, eBook and Other, reflecting the new technologies being introduced to the market. Finally, the 2015 survey included Chromebooks in response to the increase in the Other category as well as the skyrocketing growth of market share sales of Chromebooks.

Number of Computing Devices

The 2015-2016 Annual Delaware School Technology Survey (Appendix D) shows approximately 110,700 devices for instruction in Delaware schools matching the definition of fully functioning devices, as well as, over 8,300 administrative computers and tablets. Approximately 34,500 of these devices are in computer labs or library media centers. With approximately 135,000 Delaware students, the state is not near one student per device and with 34,500 of the devices in computer labs or Library/Media Centers, and others on carts, it is reasonable to assume only a small percentage of them are going home with students. The scenario other businesses operate with - each employees has at least one well-supported computing device connected to the Internet - is far from reality for Delaware students.

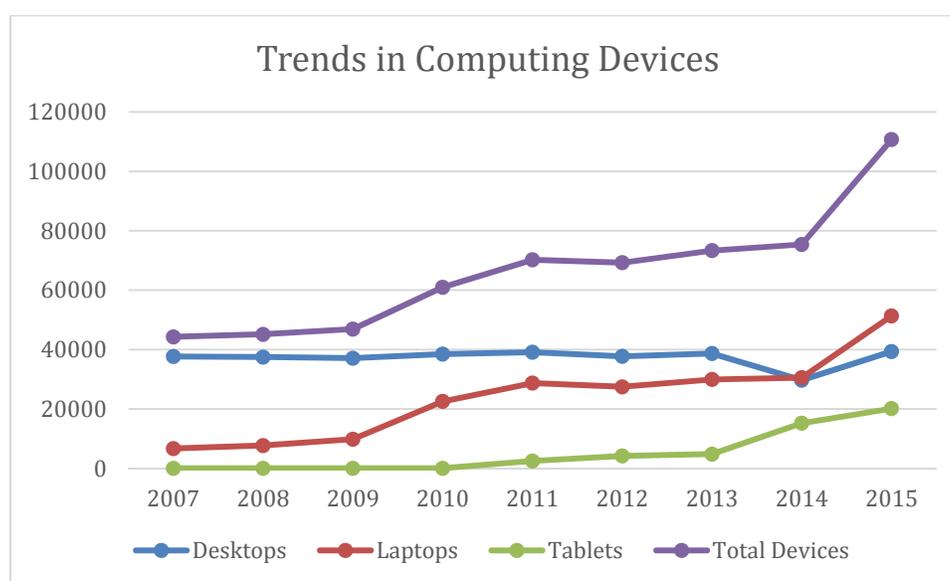


Chart 1. Trends in Computing Devices for Instruction.

The explosive growth of tablets over the past two years coupled with the increase in laptops to where they have surpassed the number of desktops, shows a strong interest in mobile devices allowing use of the devices anywhere on campus. This flexibility, however, is completely dependent upon a robust wireless network evenly distributed throughout the campus.

As for students having access to a device and the Internet at home, there are no data to tell specifically whether or not that is the case. In 2014, a study by BroadbandNow.com and others estimated that 16% of Delaware residents qualified as underserved for broadband services because either broadband service was not available or the cost of broadband was considered above a reasonable market price. This homework gap disproportionately impacts rural, western Kent and Sussex Counties with some estimates suggesting that as high as 40% of families living in these areas may not currently have a path to secure broadband service.

The homework gap is a substantial barrier to the equitable access to learning that all students should have. The gap also can negatively affect teachers' willingness to make

homework assignments that may be more engaging and more challenging because they involve accessing resources on the Internet.

The Department of Technology and Information and the Department of Education are examining other opportunities for partnership in serving Delaware’s students such as providing low-cost high-speed Internet service to families less able to afford it through service provider programs and working to provide high-volume purchasing opportunities to school districts. In addition, the Federal Communications Commission (FCC) is expected to overhaul the Lifeline program in early 2016, to help make broadband Internet affordable for low-income families. The FCC move seeks to ensure all students have access to the Internet, helping to bridge the digital divide.

Other Technologies

Also telling in a review of past surveys is the types of devices, other than computing devices that are used in the classroom. In 2007, the survey collected data on other technologies that were used in the classroom, including the number of digital cameras, Personal Digital Assistants (PDAs), printers and computer projection devices as well as servers. Over time the inventory of some technologies, such as printers, has remained relatively constant with about one printer per classroom. As the cost of projection devices (document cameras and projectors connected to a computer) fell, the number in classrooms has grown by more than a thousand a year to where there is the equivalent of one projection device per classroom. The same is true of interactive whiteboards, some of which have built in projection systems. As LEAs have purchased more and more laptops and tablets that are easily portable, there has been concomitant growth in wireless access points. Other classroom technologies such as response systems, or clickers, that allow immediate personalized responses from students to questions from teachers, seem to have leveled off, as computing devices can be used for a similar function.

Another – and more important – perspective on devices in the classroom can be gleaned from the teacher’s perspectives as shown on the Teacher survey. The majority of teachers are in classrooms that are not really ready for full technology integration, defined as “at least one computer for every three students and a SMARTBoard or other computer-related learning device.”

It is not that teachers don’t want technology. When given four statements and asked to pick the one that best applies to their current thinking, it is clear that teachers want more technology.

Current Thinking	Percent
I wish we had more technology in my classroom/our classrooms	69.41%
I wish we had less technology in my classroom/our classrooms	1.22%
My students/our students want more technology in the classroom but I do not	2.06%
The level of technology that we have now is just fine	27.31%

And teachers have asked: 54 percent of teachers have asked for more technology resources for their classrooms. When asked if they could receive any technology for their classroom,

over a third wished for iPads or tablets for each child and over a third wished for a computer or laptop for each child. Interactive whiteboards, interactive tables and projectors were far down the list. Nearly three quarters of respondents said they felt restricted with trying to utilize technology because of lack of resources. By far the primary reason was a limited number of devices. The next two reasons were that their hardware was not functioning and lack of bandwidth. Teachers were asked the open-ended question, “I need...” The second highest response on the “I need” list was “more access to technology tools to integrate in my classroom instruction.” Clearly teachers want and need more devices, and they need to be comfortable that the devices worked in the classroom and that they can get to the Internet to use the resources they need.

Changing Approaches to Instruction Enabled by Technology

Delaware has engaged in action research on effective ways to integrate technology into instruction and creating and disseminating best practices for changing approaches to instruction enabled by technology. For the 2013-2014 school year, the BRINC (Brandywine, Indian River, New Castle County Vo-Tech and Colonial) Consortium received a \$600,000 SIIP (Specific and Innovative Improvement Practices) grant from the Delaware Department of Education for *Linking to the Future* that supported personalized learning opportunities for students at all 10 high schools in those districts. BRINC envisions that students will be able to compare data about their progress against their learning goals, be exposed to new blended learning strategies for anywhere, anytime learning and have more options for non-traditional learning, such as online courses. [20]

The districts in BRINC share a deep commitment to accelerating student achievement, deepening student learning, and increasing student equity through a coordinated approach. The Consortium’s goal is to ensure that every student in every BRINC district graduates college-and career-ready by creating and supporting new personalized learning environments. BRINC’s ambitious plan to provide personalized learning opportunities for each student is driven by a shared vision for a future where teaching and learning are responsive to student needs and supported by appropriate resources.

In November 2015, the BRINC Consortium was featured on the U.S. Department of Education blog that highlights innovative ideas, promising practices, lessons learned and resources informed by the implementation of K-12 reforms to improve education for all students. The blog post, *Delaware’s BRINC Districts Collaborate to Personalize Learning for All Students*, celebrates the work of the BRINC districts and especially their efforts at collaboration. [21]

The vast majority of teachers responding to the Teacher survey are experienced users with 94% rating themselves intermediate or experienced computer users and they use computers, outside of instruction, first and foremost to access the Internet and word processing then to create instructional materials and communicate with parents. To enhance their teaching efforts, they rely most on online video content and online images, as well as the Internet for developing lesson plans and management programs for student data.

Delaware teachers seem to have very positive attitudes about the benefits of technology in the classroom. The primary benefit of technology that teachers have seen in their classroom is motivation with ‘being able to reinforce and expand on content taught’ with the ‘ability to respond to a variety of learning styles’ close behind. When given choices about what happens when they use the Internet, teachers selected “Students are more motivated” most

often, followed by “Students create products that show higher levels of learning.” When given a list of statements that were both positive and negative about technology, the two most selected statements were “The technology today allows teachers to do much more than ever before,” and “Technology is a new and exciting way of communicating with and motivating students.” The two least selected options were negative: “Technology is more of a distraction than a teaching asset,” and “Technology requires too much planning/maintenance.”

In the classroom with students, approximately two-thirds of teachers surveyed said they integrate technology into their lessons multiple times a week. However, the vast number of uses tends to focus on ways that keep the teacher as the focus of the learning as opposed to empowering the students. This is illustrated by the responses to the question, “Please rate each of the following technologies based on your understanding of each to enhance learning.” Interactive whiteboards and personal computers or laptops were virtually tied for the top spot followed by projectors to display or show media from websites or a browser. Both projectors and interactive whiteboards are primarily used with the teacher in charge. When asked how often they use these technologies, for those technologies used every day, the interactive whiteboard was the most used, followed by projectors and then personal computers and laptops. Two of the three technologies that the so-called ‘power-users’ are using are typically controlled by teachers, not students.

Overall the profile of Delaware teachers is that the majority is experienced with technology for their own use, have a positive attitude about the benefits of technology for students, and are using technology outside of the classroom to help them in their jobs and in the classroom with students, albeit primarily in a way to present information to students.

As noted in the national section, shifting the emphasis of instructional materials from print toward digital substantially enhances efforts to integrate technology throughout instruction. The shift to digital instructional materials in Delaware currently is focused on repositories. The DDOE intends to use the Schoology Learning Management System (LMS) to provide a statewide repository of instructional resources. The state contracted with Schoology in 2015 to deliver professional development through the eLearning Delaware program. In addition, districts and charters have the opportunity to use the Schoology LMS with their K-12 students at minimal cost. Within Schoology, the Resources section will be used to share instructional content. The DDOE and LEAs are working with Schoology to enhance the Resources section to provide better tagging and searching capabilities. Currently, Common Core resources are being developed and shared with the Common Ground for Common Core group in Schoology with the intent of expanding the audience in the near future.

In December 2015, Delaware joined *The K-12 OER Collaborative*, an initiative led by a group of 11 states with the goal of creating comprehensive, high-quality open educational resources (OER) supporting K-12 mathematics and English language arts that are aligned with state learning standards. The states that have signed on to the collaborative are Delaware, California, Georgia, Hawaii, Idaho, Minnesota, North Carolina, Oregon, Utah, Washington and Wisconsin. A number of organizations have “signed on” to the collaborative as well. *The K-12 OER Collaborative* has gone through an RFP process for prototype lessons from publishers and has started work on materials for middle school math, with Illustrative Mathematics as the developer. The Collaborative has secured sufficient funding to develop OER materials for grades 6-8 math and 6-8 English/language arts by the 2017-18 school

year. Delaware is hoping to participate in a 6th grade math pilot during the 2016-2017 school year. ^[22]

Opportunities in Teacher Preparation and Professional Learning

Teacher preparation programs have responsibility to prepare teachers in a wide range of areas in a short period of time. As technological change has flowed through society and, as noted, less rapidly through Pre-K – 12 education, teaching about the purposeful integration of technology throughout teaching and learning has been slow to permeate teacher preparation programs. In addition, as Table 4 shows below, many Delaware teachers have been in the classroom for a number of years.

Years Teaching	Percent of Teachers
1 – 5	19.69%
6 – 10	20.50%
11 – 15	21.24%
16 – 20	16.45%
21 or more	22.64%

Given the demographic described in Table 4, it is not surprising the negative response to the question, “To what extent has each of the following prepared you to make effective use of educational technology for instruction?” Many teachers were in teacher preparation programs when integration of technology was in its infant stage.

Preparation Area	Not Applicable	Not at All	Minor Extent	Moderate Extent	Major Extent
Undergraduate teacher education program	31.75%	27.89%	24.68%	11.17%	4.50%
Graduate teacher education program	32.80%	16.00%	22.99%	16.80%	11.41%
Professional development activities	5.91%	8.23%	37.30%	34.59%	14.06%
Training provided by staff responsible for technology support and/or integration at your school	8.51%	12.20%	36.44%	30.58%	12.28%
Independent learning	2.40%	2.16%	18.45%	33.63%	43.37%

In 2014, Delaware strengthened teacher preparation by raising the standards for entry into the teaching profession. More specifically, all Delaware teacher preparation programs have to set high admission and completion requirements, to provide high-quality student teaching experiences and ongoing evaluation of program participants, and to prepare prospective elementary school teachers in age-appropriate literacy and mathematics

instruction. With the recent adoption of the Interstate Teacher Assessment and Support Consortium (InTASC) ^[23] for all Delaware educators that includes the ISTE Standards for Teachers, ^[24] there is policy in place to ensure teachers exiting teacher preparation programs in Delaware will be more ready to integrate technology into teaching and learning.

Yet with quickly changing technology, new instructional approaches due to more rigorous standards, and in spite of often integrating the technology in the classroom, many teachers responding to the survey administered in late fall 2015 feel ill-prepared to use it effectively and are craving professional learning to help them. However, the professional learning needs to be delivered in ways that are effective and convenient for them. The teacher survey asked respondents, “Estimate how many hours of technology professional development you have received within the past two years?” The answers are stunningly low.

PD Hours	Percent
0 - 4 hours	46.67%
5 - 10 hours	29.01%
11 - 20 hours	10.40%
More than 20 hours	13.92%

The training they have received has been the most basic. While the most frequent response to what kind of professional learning they had received was “integration of technology” and second was “software applications,” the third most frequent response from nearly half of the respondents was “Basic computer use.” In last place was “Blended ‘Personalized’ Learning,” the most sophisticated use of technology, but only one-fifth of teachers selected that response.

When asked to choose the two best ways they learn how to use technology, nearly three-fourths of teachers selected “Small group/one-on-one professional development activities.” The next two most popular options chosen were “Colleagues” and “Independently.” One quarter of teachers strongly disagreed or disagreed with the statement that the technology professional development they had received in the last 12 months met their goals and needs. In the previously cited “I need” question, “More options for professional development in the areas of technology” received the highest average response. And it is no wonder. When asked, “To what extent has each of the following prepared you to make effective use of educational technology for instruction,” the lowest ranked item was “Undergraduate teacher education program” and the highest by far was “Independent learning.”

As noted in the national section, the two most effective ways to deliver the type of professional learning that matches the research-based characteristics of high-quality professional learning are digital literacy coaches and online professional learning.

While some LEAs in Delaware have had some experience with digital literacy coaches, there has to date not been a major emphasis on this model. However, the state has substantial experience with online professional learning. eLearning Delaware (eLDE) offers a variety of educator choice and mandatory trainings delivered via the Schoology Learning

Management System. The eLDE facilitator-led educator choice courses are offered during four, seven-week sessions (fall, winter, spring, and summer) with 4-6 weeks of content. The courses are entirely online but during each week, there are specific activities and a discussion. Upon successful completion of a course, participants receive a certificate for clock hours earned that can be applied toward the 90-hour re-licensure requirement. During the 2015-2016 school year, eLDE expanded beyond traditional online courses to include self-paced, on demand modules related to Common Core.

The eLearning Delaware platform is also used to deliver a variety of mandatory training, such as Child Abuse and School Bullying to the Delaware educational community. Mandatory training is self-paced and successful completion of a quiz or assurance is required for awarding of credit.

In addition to the eLearning Delaware state level professional development system, the Schoology LMS is being used during the 2015-2016 school year by 24 LEAs covering 121 schools with almost 80,000 students to deliver online content to K-12 students. The Schoology LMS allows educators to deliver blended learning to personalize instruction. The number of participating school and students is expected to grow for 2016-2017.

Goals, Strategies, and Recommendations: Teaching and Learning

Goal 3 – Computing Devices

By the 2019-2020 school year, all students will have access to a computing device at school and at home, to enhance learning and provide them with technology skills and savvy.

Strategies

1. Negotiate a state contract with volume purchasing power for multiple types of devices that districts can access. The contract should include options for professional learning, technology support, and provisions for full accessibility for the benefit of all students and educators with disabilities.

Rationale: The state could use volume purchasing to provide leverage for lower prices and make those prices available to school districts. Because all districts need professional learning and technology support, building those options into a state contract also may provide capabilities that districts may not be able to get on their own, and most probably not at the price the state could negotiate.

Recommendation 3.1.1: *Form an RFP committee consisting of representatives from DTI, DDOE and the LEAs to determine the criteria for an RFP and issue an RFP that will be awarded by spring 2017.*

Goal 4 – Teacher Preparation

By 2020, all students graduating teacher preparation programs in Delaware will be confident and effective in using technology to enhance students' learning experiences as illustrated by the ISTE Standards for Teachers.

Strategies

1. Ensure teacher preparation programs prepare students entering the teaching profession with the necessary skills to effectively integrate technology into students' learning experiences and offer advanced degrees/certificates for practicing teachers.

Rationale: In 2014, the state strengthened teacher preparation by raising the standards for entry into the teaching profession. More specifically, all Delaware teacher preparation programs have to set high admission and completion requirements, to provide high-quality student teaching experiences and ongoing evaluation of program participants, and to prepare prospective elementary school teachers in age-appropriate literacy and mathematics instruction. With the recent adoption of the ISTE Standards for Teachers and the Interstate Teacher Assessment and Support Consortium (InTASC) for all Delaware educators, there is a need to provide instructional and technology support for those new teachers entering the field. Evidence of this lack of preparedness on integrating technology into learning comes from the teacher survey. One survey question asked, "To what extent has each of the following prepared you to make effective use of educational technology for instruction?" Undergraduate teacher education program had the lowest overall score among the four options with 29% saying it prepared them "Not at all." Only 4.5 percent said it prepared them to a "major extent." The second lowest score was for "Graduate teacher education." With over half of the teachers responding having graduated from an institution from within Delaware, increasing the focus on teaching with technology could have a significant positive impact on future teachers in Delaware.

Recommendation 4.1.1: *The Delaware Professional Standards Board in tandem with the State Board of Education should consider adopting either a credit minimum or competency based requirement around the integration of technology into learning for teacher candidates seeking an initial license.*

Recommendation 4.1.2: *Teacher Preparation programs should be encouraged to offer advanced degrees or certificates on teaching and learning with technology and blended learning to personalize instruction for practicing educators.*

Goal 5 – Professional Learning

Practicing educators in Delaware will be confident and effective in integrating technology to enhance students' learning experiences as illustrated by the Interstate Teacher Assessment and Support Consortium (InTASC) and the ISTE Standards for Teachers and consistent with PSB Regulations 1598 and 1599 and following.

Strategies

1. Adopt and implement the International Society for Technology in Education (ISTE) standards for students and coaches.

Rationale: In 2014, the *Delaware Professional Standards Board and the State Board of Education* adopted the ISTE Standards for Teachers and the ISTE Standards for Administrators. To strengthen the integration of technology

into teaching and learning, the ISTE standards should extend to students and coaches.

Recommendation 5.1.1: *The Delaware Professional Standards Board and the State Board of Education should expand Regulation 1599 beyond standards for teachers and administrators by adopting the ISTE Standards for Students and ISTE Standards for Coaches.*

2. Establish an LEA Digital Learning Coach position to support educators in effectively implementing digital learning to fulfill the ISTE standards.

Rationale: The Teacher survey has numerous questions related to teachers' needs for professional learning. For example, 66% of teachers said they integrate technology into student learning "multiple times per week," 13% said they integrate technology "once a week," and the remaining 21% integrated technology a few times a month or less. When asked how many hours of technology professional development they had received within the past two years, nearly half (47%) said 0-4 hours and 29% said 5-10 hours. When given a choice of ten possible responses to the prompt, "I need..." the top response was "More options for professional development in the areas of technology." Finally, when asked, "What are two ways you learn best on how to use technology," the response 'Small group/one-on-one Professional Development Activities' was by far the top choice with 73.15 percent, followed by 'Colleagues' with 47.60 percent. Both these approaches are fully compatible with coaching as a favored approach to professional learning and the need to effectively implement the ISTE standards. .

Recommendation 5.2.1: *Ensure LEAs have sufficient resources to support a minimum of one digital learning coach per LEA and for larger LEAs, sufficient digital learning coaches to address the needs and vision of the LEA.*

3. Provide online personalized professional learning, research, and collaboration opportunities for educators that are tied to practice and aligned to ISTE standards through an online virtual network.

Rationale: Investment in technology is more than devices and bandwidth; it also is professional learning and change management. Put together it is a substantial investment of money and time and possibly opportunity cost. Having the flexibility to work independently online fits many teachers' preferences for how they work in preparing for class as well as in their personal use of a computer. Research from Texas Gateway, an online professional learning community established and maintained by the Texas Education Agency (State Department of Education), has shown that having small "chunks" of professional learning, as well as larger modules and courses, increased the number of visits to Texas Gateway by three-fold. [25] In addition, highlighting evidence-based practices in all aspects of technology integration for Delaware teachers would enhance collaboration among educators around the state ultimately benefiting student learning.

However, research in a vacuum is of little or no value. Full dissemination via existing organizations, such as the Teaching and Learning Cadre, Digital Learning Cadre, Instructional Technology Users Group – Delaware, TechMACC (Technology Managers and Computer Coordinators), and Schoology Champions Cadre, not only will spread the word of successful practices, it also will strengthen and add value to existing organizations. The BRINC consortium already is modeling the use of technology, and would serve as an initial model of the effort.

Recommendation 5.3.1: *Provide online personalized professional learning, research, and collaboration opportunities for educators that are tied to practice and aligned to ISTE standards through an online virtual network.*

4. Establish and maintain a “Leading in the Digital Age” on-going, sustained, professional learning program for teacher leaders, principals, superintendents, and other education leaders.

Rationale: Professional learning for all educators is no longer a luxury but rather a necessity to ensure that educators continue to strengthen their practice throughout their career. As the instructional leader of the school, the principal needs to be aware of policies and practices that enable effective instruction, and in the 21st century, technology plays a key role in effective instruction. Therefore, principals and other leaders throughout the LEA, need to be aware of the latest technologies available for instruction and ways they can be used effectively and efficiently by teachers and students, and leaders need to know how to help teachers use these tools. Leadership has the responsibility to ensure that educators within their schools engage in continuous professional learning and apply that learning to increase student achievement. By advocating for professional learning that meets the needs of the teachers where they are, Delaware can do its part in ensuring a successful education experience for every child in the state.

Recommendation 5.4.1: *Establish and maintain a “Leading in the Digital Age” on-going, sustained, professional learning program for teacher leaders, principals, superintendents, and other education leaders.*

Goal 6 – Blended Learning to Personalize Instruction

Students and educators will have access to a statewide online virtual network that will include digital resources and data analysis capabilities to deliver blended learning to personalize instruction for students.

Strategies

1. Provide LEAs with the opportunity to purchase licenses at a low cost for a statewide learning management system for use with K-12 students that is integrated with the statewide pupil accounting system.

Rationale: The Schoology Learning Management System is being used in the 2015-2016 school year by 24 LEAs in 121 schools with approximately 80,000 students to deliver blended learning opportunities to K-12 students. These

numbers are expected to increase during the next two school years to 110,000 students. The DDOE and LEAs have a cost share for the Schoology accounts where the state pays \$1.83 per student account and the LEAs pay \$1.50. With the purchase of student accounts, all educator accounts are at no additional cost. The FY17 budget request of \$48,000 (\$48.0) is \$30,000 (\$30.0) to cover the increase in actual costs incurred in FY16 for 80,000 student accounts and \$18,000 (\$18.0) for the expected increase to 110,000 students over the next two years. The Governor's Recommended Budget includes the \$30,000 (\$30.0) for maintaining the current use, but not the \$18,000 (\$18.0) for more students. In addition, we have a one-time opportunity in June 2016 to decrease the per student cost from \$3.33 to \$3.00 if we reach 100,000 students. Without the funding for the increase in student participation, we will need to maintain the 80,000 student accounts and lose the opportunity to reduce our per student cost.

Recommendation 6.1.1: *Maintain a statewide contract for a learning management system and ensure a per student cost-share between the Department of Education and the LEAs.*

2. Establish a repository as part of the statewide online virtual network with processes to develop, manage and assess instructional resources, including Open Educational Resources and expand current initiatives to include curriculum subscriptions.

Rationale: In order to personalize learning for students, teachers need access to a variety of instructional resources. The “one size fits all” approach of the past focused on the same textbook as the single source of content for all students in a class is inappropriate at a time when we are able to know more about how today’s digital natives learn best. Having the instructional resources linked to state standards and being able to track how those resources are used can provide diagnostic feedback for teachers which would undoubtedly impact student achievement.

New models for the acquisition and use of instructional materials such as Open Educational Resources and statewide subscriptions to online services for content also can save LEAs money that can be used for professional learning, devices, bandwidth, or technology support.

Recommendation 6.2.1: *Provide resources and personnel sufficient to build and support a statewide repository for instructional resources.*

3. Provide resources and professional learning so that by the 2019-2020 school year, the majority of resources used in Delaware grades 3–12 classrooms are digital and are accessible for all students, including students with disabilities who may use assistive technologies to access their learning materials.

Rationale: As the state moves closer and closer to the goal of every student having a device for learning to use in school and out of school, it becomes more important for students to have easy access to a variety of instructional resources for learning as these materials shift from print toward digital. In addition, students will be using various digital resources to create content in solving real world problems demonstrating higher order thinking skills. For some teachers, using primarily digital resources will require professional learning on everything from managing the resources among

students to copyright laws to new instructional approaches that provide access to learning for all students. In response to the prompt from the teacher survey, “I think...” the highest average response was “Technology has changed the way I teach,” but the third highest response was “School systems expect us to learn new technologies without formal training.” By not addressing this need, the outcome will result in the uneven, ineffective and inefficient integration of technology in teaching and learning ultimately impacting student achievement.

Recommendation 6.3.1: *Conduct a detailed analysis of Delaware code, regulations, and policies to ensure there are no barriers to purchasing digital resources with existing funding streams for textbooks and instructional materials.*

Recommendation 6.3.2: *Provide sufficient resources and professional learning so that by the 2019-2020 school year, the majority of resources procured and used in Delaware grades 3–12 classrooms are digital and fully accessible.*

Assistive Technology

National Perspective

Use of Technology for Students with Disabilities

According to the Individuals with Disabilities Education Act (IDEA) section 602, assistive technology is “any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of a child with a disability.” Sec 300.6 states that assistive technology services are “any service that directly assists a child with a disability in the selection, acquisition, or use of an assistive technology device.” This includes evaluating a child’s needs, acquiring a device, and providing ongoing personalization of the device for the child’s needs, coordinating use of the device across the child’s school day, and training professionals and family members to use the device. ^[26]

Simply speaking, assistive technology (AT) is anything that enables an individual with a disability to accomplish something that would be impossible—or more effortful, less efficient or of lower quality—without the support from the technology. In the case of children and youth with disabilities, mainstream technology qualifies as AT if it meets the above definition. For this reason, it is inappropriate to consider AT as completely distinct from other educational technology. Many mainstream devices, such as laptops, tablets and Chromebooks, have built-in accessibility features that afford invaluable supports for students with sensory, physical and learning challenges; additional software and apps extend the usefulness of these devices for children and youth with disabilities. At the same time, there are “dedicated” AT devices and technology-enabled strategies that have been developed specifically for individuals with disabilities. Interestingly, some technologies that were originally developed as supports for people with disabilities have been embraced by society as a whole. For example, the word prediction that enables us to compose text messages more efficiently was originally developed to enhance the generation of messages

in augmentative communication devices, and the captioning that lets us watch TV in noisy environments began as an accommodation for individuals with hearing loss.

Universal Design for Learning (UDL) represents another strategy for engaging students with the curriculum and supporting them in demonstration of their capabilities. When the curriculum is universally designed, it contains a multitude of different access points for students with differing strengths, challenges and preferences. Rather than assessment or instruction being delivered in one way—to which all students must accommodate—it expects that the curriculum will contain built-in affordances. For example, rather than relying on a textbook to be the sole purveyor of information, a universally-designed lesson would offer multiple ways to access the same information: in traditional print, in digital format so that the print could be transformed in ways that improve access (e.g., made larger, read aloud, converted to Braille), and in other media such as animated demonstrations or videos. Assistive technology often serves as the key to activating student's preferred access to, and interaction with, a universally-designed curriculum.

Although the Individuals with Disabilities Education Improvement Act (P.L. 108-446) now governs the education of students with disabilities from birth through the time that they exit the public education system, it was actually the 1997 reauthorization that dramatically impacted access to AT. The 1997 reauthorization referenced the definition of AT above, and it also required consideration of the AT needs of every student receiving special education services. ^[27] Section 504 of the Rehabilitation Act of 1973, as amended, is civil rights legislation that applies to all students with disabilities, even those who are not eligible for special education services under IDEA. Section 504 establishes students' entitlement to AT that enables them to access an education equal to that provided to their peers without disabilities.

There is abundant and incontrovertible evidence that assistive technology affords access to the general education curriculum and enables children and youth to participate and achieve to a much greater extent than they could without AT services and supports. Assistive technology mitigates the barriers posed by students' physical, sensory and/or cognitive limitations, enabling students to demonstrate their gifts and talents. As a consequence, the dynamics around expectations change, leading students, their families and the people who support them to envision a future in which the students are college and career ready, engage in lifelong learning, and participate as active and contributing members of their communities.

Delaware Perspective

Students with Disabilities and Assistive Technology

In Delaware, assistive technology (AT) consideration, access and use is quite uneven across LEAs, and even from school to school and classroom to classroom. Other than a reiteration of the federal requirements regarding AT in the Delaware Administrative Manual for Special Education Services, the Delaware Department of Education has issued no additional guidance to LEAs regarding AT consideration, access and use. As evidenced in data collected at many junctures, education personnel feel ill equipped to meet their AT-related obligations to students because of confusion regarding roles and responsibilities, consideration and evaluation processes, and acquisition mechanisms (including funding issues).

In many instances, the requirement to consider AT for all students for whom an IEP is developed is ignored. This may be due to reluctance to incur costs, to ignorance of the legal mandate for consideration, to lack of knowledge about available AT and what it brings to the learning enterprise, or to lack of clarity about who has responsibility for the evaluation of student needs and the determination of the devices and services that will best meet student needs.

The deployment of AT expertise across LEAs is also quite uneven. Some LEAs have dedicated AT Specialists on staff that support team decision-making and assist educators in implementing AT effectively. Other LEAs have no formalized mechanisms—or the personnel who support their implementation—relative to AT access, despite the clear mandates for AT access and use in IDEA.

Tremendous barriers to AT access arise from the perceived lack of funding for AT. Personnel are implicitly and explicitly urged to avoid consideration of AT for fear of the fiscal implications, and there seems to be very limited awareness of how to maximize multiple sources of financial support for AT access.

With federal funding, the Delaware Assistive Technology Initiative (DATI) was established in 1991 to connect people with disabilities with the tools they need in order to learn, work, play and participate in community life safely and effectively. The Technology-Related Assistance Act of 1988 authorized the establishment of an AT program in each state and territory to increase citizens' awareness of and access to AT. The Act was reauthorized in 1994, with a shift in emphasis to elimination of systemic barriers to AT access. The AT Act of 1998 continued support for state AT programs, but dramatically reduced the amount of funding available. The most recent authorization of the Act requires state AT programs to provide four core services—AT demonstration, AT loan, AT reuse, and alternative financing of AT—in addition to training, technical assistance and coordination functions.

The DATI is a program of the Center for Disabilities Studies at the University of Delaware. DATI operates an Assistive Technology Resource Center in each county in which Delaware residents can access equipment demonstrations, borrow devices for trial use at no cost, or participate in an equipment exchange program connecting people who have AT they no longer need with those who could use it. The centers are staffed by knowledgeable AT Specialists who help individuals explore AT options that might meet their needs. Among their customers are people with disabilities and their family members, educators, healthcare professionals, case managers, and others with an interest in facilitating AT access. DATI staff assist customers in finding a means to acquire the AT they need, and operates several equipment giveaway programs.

Over the years, the DATI has collaborated with many state agencies seeking to enhance AT access and use for their constituents. DATI has partnered with the Delaware Department of Education (DDOE) in increasing the awareness of educators relative to AT, Universal Design for Learning (UDL), and accessible instructional materials (AIM). The Center for Disabilities Studies currently operates the Delaware AIM Center, a centralized source of accessible materials to LEAs statewide, under contract from the DDOE, and also manages the SPEACS project, which seeks to enhance the communication skills of students with the most complex communication needs.

Through a unique partnership between the Delaware General Assembly and the State of Delaware's Secretary of Education, the DDOE was authorized to perform a comprehensive review of the delivery of special education services within the state's public schools. In

addition, DDOE was authorized to create a position to conduct this review and subsequently create a strategic plan. This was formalized in the Delaware FY2015 Budget, Section 307 Epilogue: “Said review shall include, but not be limited to, the provision and funding of assistive technology in the classroom; the coordination and distribution of information on services available for children with disabilities that cross multiple state agencies; and creating a strategic plan for special education services.”

Goals, Strategies, and Recommendations: Assistive Technology

Goal 7 - Assistive Technology: Students

Ensure all students, including students with disabilities, will have access to technology that will help them learn and achieve.

1. Create and adopt uniform guidance addressing assistive technology consideration, access and support for children with disabilities ages birth through 3.

Rationale: Federal law mandates that children with disabilities up to age 3 have access to assistive technology supports and services that enable their participation and development.

Recommendation 7.1.1: *Develop and promulgate Delaware Assistive Technology Guidelines that specify expectations regarding the processes by which assistive technology is considered, assistive technology needs are evaluated, assistive technology is acquired and customized, and children and families are supported in using AT to enhance access to and participation in routines and activities.*

2. Create and adopt uniform guidance addressing assistive technology consideration, access and support for preschool, elementary, and secondary students with disabilities, ages 3 through 21.

Rationale: Federal law mandates that students with disabilities served in the PreK-12 education system have access to assistive technology supports and services that enable them to access the general education curriculum and succeed as learners.

Recommendation 7.2.1: *Develop and promulgate Delaware Assistive Technology Guidelines that specify expectations regarding the processes by which assistive technology is considered, assistive technology needs are evaluated, assistive technology is acquired and customized, and students are supported in using assistive technology to learn, demonstrate their abilities, and transition successfully into adult life.*

Recommendation 7.2.2: *Develop and promulgate guidance that specifies expectations regarding the procurement of accessible educational technology and the processes for ensuring compatibility among infrastructure, hardware, and software so that students with disabilities have contemporaneous access to the same learning opportunities as their peers without disabilities.*

3. Establish a centralized fund to assist early intervention providers and LEAs in acquiring the assistive technology determined by teams to be necessary for children with disabilities to benefit from early intervention or educational services.

Rationale: Access to assistive technology is a right assured through federal law (IDEA), yet access to assistive technology can be compromised by fiscal constraints. There are existing funding mechanisms supporting assistive technology access and use, yet these mechanisms are not utilized to their full potential, in part because neither eligibility parameters nor the processes for accessing these mechanisms are clear. Enhanced access to assistive technology can be facilitated through clarification of the various funding mechanisms that can be accessed in support of assistive technology acquisition. Assistive technology access should not be constrained by the fiscal challenges within LEAs; the establishment of a centralized fund to assist in the acquisition of assistive technology will contribute significantly to assuring consistent and equitable access to assistive technology throughout the state.

Recommendation 7.3.1: *Clarify, via the Delaware Assistive Technology Guidelines, the range of possible sources supporting AT acquisition and the mechanisms for accessing those sources, and establish a centralized fund to assist in the acquisition of assistive technology, including guidelines for utilization of the fund that reflect the necessity of student-specific assistive technology selection and an expectation of shared state/local obligation.*

Recommendation 7.3.2: *Support the FY18 assistive technology budget request in the work from the Department of Education's comprehensive review of the delivery of special education services, including assistive technology, authorized by Section 307 of the FY 2015 budget epilogue.*

Goal 8 - Assistive Technology: Educators

All educators will have sufficient knowledge, skills, and dispositions—as well as access to consistent and predictable acquisition mechanisms—to ensure that students with disabilities have access to the AT needed for engagement, learning and skill demonstration.

Strategies

1. Create companion documents to the Individualized Education Plan (IEP) and Individualized Family Service Plan (IFSP) that prompt teams to engage in assistive technology consideration and documentation consistent with federal law and Delaware Assistive Technology Guidance documents.

Rationale: The integration of targeted assistive technology guidance in IEP templates/instructions will afford efficient access to supports for teams as they consider and document assistive technology needs as well as the assistive technology services and supports that are needed for children to receive a free and appropriate public education (FAPE). Uniform guidance will assist teams across the state in implementation assistive technology consideration and documentation in a thorough and consistent manner.

Recommendation 8.1.1: *Develop and embed electronic assistive technology templates that can be used and appended to hard copies of the IEP/IFSP.*

2. Create and deliver comprehensive professional development to ensure that all educators act in compliance with federal law and the Delaware Assistive Technology Guidelines.

Rationale: The existence of guidance does not guarantee compliance. It is essential that all personnel providing services to children with disabilities in the early intervention and public education system are aware of, and familiar with, the guidance so that they can provide services and supports consistent with the mandates expressed in federal law.

Recommendation 8.2.1: *Create online and face-to-face professional learning opportunities for all members of a child's IEP/IFSP team. The content should be differentiated for a range of audiences who need varying degrees of detail, and there will also be an overview developed for families and students.*

3. Establish competencies for those serving in assistive technology leadership roles to ensure that all teams have access to adequate assistive technology expertise.

Rationale: The assistive technology field is in a state of perpetual evolution, and it is unrealistic to expect that all educators will maintain current expertise relative to the assistive technology marketplace as well as methods and strategies for infusion of assistive technology into educational processes. Rather, teams should have consistent and predictable access to individuals who maintain a high level of competence relative to assistive technology and who can assist teams in assistive technology consideration, evaluation, selection and use.

Recommendation 8.3.1: *Devise competencies for those serving in assistive technology leadership roles in the early intervention and educational contexts. The competencies should reference high-quality educational practices, expertise in consultation and facilitation of team processes, and the expectation that those in AT leadership roles will have the dispositions, breadth of knowledge, and depth of skill to support the full range of AT needed by students.*

Current Funding Streams for Educational Technology

If we expect to have a vibrant technology infrastructure, computing devices in the hands of our students, and teachers trained in the integration of technology that will prepare our students to be college and career ready, the state needs to provide the LEAs and state agencies with consistent, dedicated funding streams for technology that allow the flexibility for the LEAs to determine local need and fund appropriately.

Broadband Funding Streams

Since 1994 the state has provided a robust technology infrastructure through the Department of Technology and Information that provides broadband access to the Internet

along with all core network services. Broadband access migrated from T1 lines (1.4 Mbps) to 10 Mbps circuits beginning in 2005 with the vast majority of schools migrated by 2007 and the remaining schools being completed prior to online assessment in 2010. Ten Mbps still remains as the baseline funded by the state, although LEAs have the option of increasing this bandwidth at their cost creating equity issues across the state. The district superintendents, to ensure capacity to deliver digital learning opportunities to our students, have made the increase of broadband access to a minimum of 100 Mbps in the elementary schools and 1 Gbps (1,000 Mbps) in the middle schools and high school as their number one funding request for FY17.

Increasing broadband access will also involve upgrading capacity at the core of the network at DTI and upgrading the internal networks in the schools such as switches, fiber between wiring closets (the fiber is currently close to 20 years old and is not capable of transmitting broadband speeds of 1 Gbps and 10 Gbps), and wireless access. Currently, even though the state has traditionally supported the telecommunications infrastructure, the LEAs are fully responsible for the wireless networks in our schools including all costs and what wireless system to use.

Since 1998, there has been federal support through the E-rate program for both broadband access (Category 1 services) and internal connections (Category 2 services). With the E-rate modernization in 2014, Delaware now has the opportunity to receive funding for internal connections, including wireless. The E-rate provides a tremendous opportunity to upgrade the internal telecommunications infrastructure of our schools with the support of Category 2 funds at great cost savings. With E-rate Category 2 services, each school can request up to \$150 per student over a five-year period. Using E-rate discount data and student enrollment for the 2015-2016 school year, there were 135,152 students which means our schools can request over \$20 million (\$20,272.8) in E-rate Category 2 services that will be discounted by \$14,604.5 (72.04%) with the balance, over the five-year funding cycle, of \$5,668.3 being the responsibility of the schools. Currently, this entire cost falls on the LEAs even though traditionally, the state has supported the telecommunications infrastructure. As this report is being written, the second year of the five-year cycle is approaching and only a minimal number of LEAs took advantage of this opportunity in the first year.

Computing Device Funding Streams

The state has periodically supported the purchase of computers. Beginning in FY99, with a dedicated funding stream for a period of three years, the state provided \$13 million (\$13,000.0) with the districts providing \$7 million (\$7,000.0) for classroom technology. In FY99, knowing that the influx of computers would require technical support, districts were given the capability of generating half their local match (approximately \$3.5 million (\$3,500.0) statewide) in “matching funds” from the tax base for technical support. With the advent of online assessment and the concern of having enough computers to support both online assessment and digital learning, beginning in FY14 the state provided \$2.65 million (\$2,650.0) in annual funding for the purchase of technology to support online assessment, through a dedicated funding stream via the Office of Management and Budget.

Over the years, the funding of technology support and replacement cycles for computers have been topics of discussion. In FY01 the Technology Block Grant of \$1 million (\$1,000.0) was put into place to address these issues giving districts a funding stream to provide technology support and to purchase computers. The Technology Block Grant is a good funding mechanism, but has never been funded at the level sufficient to supply the needed

support or replacement cycles for computers. In FY16, the Technology Block Grant was \$2.25 million (\$2,250.0).

The Delaware Center for Educational Technology supports online professional learning and mandatory training through the eLearning Delaware program. Funding for eLearning Delaware comes from the DCET operations budget. Our educators deserve just-in-time, on demand, self-paced courses and online professional learning opportunities aligned to identified areas of growth for continuous improvement. In addition, there isn't sufficient funding to support the development of the repository of instructional material including the vetting of resources. The minimal eLearning Delaware budget will need to be increased to meet the demand.

The eLearning Delaware program uses the Schoology Learning Management System to deliver online content. In addition, 24 LEAs (121 schools with approximately 80,000 students) are using Schoology to deliver blended learning opportunities to K-12 students. The DDOE and LEAs have a cost share for the Schoology accounts where the state pays \$1.83 per student account and the LEAs pay \$1.50. With the purchase of student accounts, all educator accounts are at no additional cost. The budget request of \$48,000 (\$48.0) is \$30,000 (\$30.0) to cover the increase in actual costs incurred in FY16 for 80,000 student accounts and \$18,000 (\$18.0) for the expected increase to 110,000 students over the next two years. The Governor's Recommended Budget includes the \$30,000 (\$30.0) for maintaining the current use, but not the \$18,000 (\$18.0) for more students. In addition, we have a one-time opportunity in June 2016 to decrease the per student cost from \$3.33 to \$3.00 if we reach 100,000 students. Without the funding for the increase in student participation, we will need to maintain the 80,000 student accounts and lose the opportunity to reduce our per student cost.

Funding Recommendations for Our Path Forward

Not all goals, strategies, and recommendations have direct budget implications, but those that do must be addressed. There must be consistent, dedicated funding streams to address:

- the network core, broadband access, Internet access and associated services as provided by the Department of Technology and Information;
- internal school networks, including wireless access, to achieve a 5–7 year replacement cycle;
- a technology allocation fund that can be used to purchase or lease computing devices, provide technical support, and provide for professional learning for educators;
- the matching provisions of the Technology Block Grant for technology support;
- the expansion and growth of eLearning Delaware;
- a statewide repository for instructional resources;
- the per student cost of the learning management system for K-12 student use; and
- assistive technology for students with disabilities.

The following recommendations address the additional funding needed to accomplish the goals and strategies in this plan.

Note: Budget amounts are in thousands (\$1,000.0 = \$1,000,000 = \$1 million)

- A. Provide funding for the network core, broadband access, Internet access and associated services as provided by the Department of Technology and Information. (Reference Goal 2, Strategy 1.)

Budget Recommendation 1

Support the \$3,000.0 FY17 budget request from DDOE that will ensure all elementary schools will have 100 Mbps bandwidth capability and all middle and high schools will have 1 Gbps (1,000 Mbps) for the 2016-2017 school year as well as associated increases at the network core to support the bandwidth increase. This request is part of the Governor's Recommended FY17 Budget placing the funds at DTI.

Budget Recommendation 2

Request \$1,200.0 in FY18 to increase bandwidth for all schools to 1 Gbps to align with FCC/SETDA guidelines and increase associated network core services to support the bandwidth increase.

- B. Provide funding in conjunction with the E-rate discount structure for internal school networks, including wireless access, to achieve a 5–7 year replacement cycle. (Reference Goal 2, Strategy 2.)

Budget Recommendation 3

Establish an E-rate Category 2 funding stream of \$1,250.0 annually to cover the district/state cost of E-rate Category 2 eligible services.

Budget Recommendation 4

Explore the possibility of creating an E-rate Category 2 funding stream by establishing a Delaware Universal Services Fund (USF) for E-rate, not unlike the Delaware Broadband Fund.

- C. Establish a technology allocation fund that can be used to purchase or lease computing devices, provide technical support, and provide for professional learning for educators. (Reference Goal 2, Strategy 3.)

Budget Recommendation 5

Expand the purpose and size of the Technology Block Grant so it can be used as the funding stream for a "technology allocation" to the LEAs that would include the ability to provide for technology support (position or contractual), lease/purchase of computing devices, professional learning (Digital Learning Coach), and other technology-related needs of the LEA.

Budget Recommendation 6

Support the \$1,000.0 FY17 budget request from DDOE to increase the Technology Block Grant from \$2,250.0 to \$3,250.0. This request is part of the Governor's Recommended FY17 Budget.

Budget Recommendation 7

In FY18, move the \$2,650.0 annual funding used from FY14-FY17 for the purchase/lease of computers from OMB to the Technology Block Grant.

Budget Recommendation 8

Increase the Technology Block Grant funding by a minimum of \$1,000.0 annually beginning in FY18 until the total amount reaches the equivalent of one hundred dollars (\$100) per student.

- D. Update the local technology support matching provision of the Technology Block Grant (14 Del. C. 1902(b) and 71 Del Laws, c. 378). (Reference Goal 2, Strategy 3.)

Budget Recommendation 9

Currently, the Technology Block Grant matching funds are tied to FY98 Division I unit allocations. The matching funds cap should be adjusted to align with the amount allocated through the Technology Block Grant once the Technology Block Grant exceeds \$3,500.0.

- E. Provide funding to expand and grow eLearning Delaware to include development and delivery of online professional learning, research and collaboration opportunities, and a statewide repository for instructional resources. (Reference Goal 5, Strategies 2-4 and Goal 6, Strategies 1-2.)

Budget Recommendation 10

Provide \$500.0 in FY18 and an additional \$250.0 in FY19 to eLearning Delaware to support the development and delivery of online professional learning, research and collaboration opportunities, and a statewide repository for instructional resources.

- F. Provide funding to the Department of Education to provide at least 50% of the per student cost of the Schoology Learning Management System for K-12 student use. (Reference Goal 6, Strategy 3.)

Budget Recommendation 11

Support the \$48.0 FY17 budget request from DDOE to support the increase in annual subscription service fees for Schoology due to increase in number of students using the system. This request is partially in the Governor's Recommended FY17 Budget - \$30.0 is included to cover actual costs incurred in FY16, but \$18.0 is NOT included to cover additional student participation in FY17.

- G. Establish a centralized fund to assist early intervention providers and LEAs in acquiring the assistive technology determined by teams to be necessary for children with disabilities to benefit from early intervention or educational services. (Reference Goal 7, Strategy 3)

Budget Recommendation 12

Strongly recommend supporting the FY18 assistive technology budget request, amount to be determined in fall 2016, in the work from the Delaware Department of Education's comprehensive review of the delivery of special education services, including assistive technology, per FY15 Epilogue Section 307.

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Appendix A: Senate Concurrent Resolution No. 22

Senate Concurrent Resolution No. 22

SPONSOR: Sen. Townsend & Sen. Sokola & Rep. Jaques & Rep.
Paradee
Sen. Bonini

DELAWARE STATE SENATE
148TH GENERAL ASSEMBLY

SENATE CONCURRENT RESOLUTION NO. 22

ESTABLISHING A TASK FORCE TO STUDY EDUCATIONAL TECHNOLOGY AND UPDATE THE STATE EDUCATIONAL TECHNOLOGY PLAN

WHEREAS Delaware students are digital natives who live in a global, connected world and need to be educated in this space to be made college and career ready; and

WHEREAS all Delaware students deserve to have access to educational technologies to enhance learning and provide them with the technological skills and savvy they will need to be productive and globally competitive citizens; and

WHEREAS there are six school districts participating in the Brandywine, Indian River, New Castle County Votech and Colonial (“BRINC”) consortium that is modeling the use of technology in classrooms, providing professional development for teachers, and providing valuable insight for lessons learned about the expanding use of instructional technology; and

WHEREAS the educator preparation programs in Delaware are including the use of technology for instruction in their curriculum; and

WHEREAS teachers need ongoing professional development to ensure they are able to confidently and effectively integrate technology as an instructional tool in their classrooms; and

WHEREAS the State of Delaware currently pays for 10 megabytes of bandwidth to schools, which falls well below the recommended amount to support the internet needs of the student population; and

WHEREAS infrastructure should be engineered to support the internet demand of a school in order to support current and innovative technology uses; and

WHEREAS the availability of assistive technology is of particular importance to the successful education of students with special needs and is influenced by the funds available to public schools’ special education programs; and

WHEREAS the State of Delaware Educational Technology Plan has not been updated since 2001;

NOW, THEREFORE:

BE IT RESOLVED by the Senate of the 148th General Assembly of the State of Delaware, the House of Representatives concurring therein, that a “Task Force on State Educational Technology” is established.

BE IT FURTHER RESOLVED that the Task Force on State Educational Technology shall review the current condition of technology in the public education classrooms and educational settings of the State and shall prepare a plan to outline actions that support Delaware becoming the premier state for utilizing technology in pre- kindergarten to grade 12 education. The taskforce shall:

- (a) Review current need of expansion of State-provided bandwidth;
- (b) Determine the current use of educational technology in classrooms or education settings of the State;
- (c) Determine the current use of educational technology, assistive technology and instructional materials for students with special needs and incorporate, as appropriate, the work from the Department of Education’s comprehensive review of the delivery of special education services, including assistive technology, authorized by Section 307 of the FY 2015 budget epilogue;
- (d) Determine the current readiness of staff to teach using educational technology in the State’s public education classrooms and education settings and determine the need for improved ongoing professional development in the integration of technology and assistive technology in teaching and utilization of the State educational technology standards;
- (e) Recommend strategies and goals for improving and equalizing access to and use of educational technology and assistive technology in all public school systems across the State, including State-run schools;
- (f) Coordinate strategies for pre-kindergarten to grade 12 educational technology with national standards;
- (g) Recommend a phased plan for the implementation of the State educational technology plan;
- (h) Recommend a funding plan for the implementation of the State educational technology plan;
- (i) Recommend a plan to track and assess progress in the implementation of goals set forth in the State Educational Technology Plan.

BE IT FURTHER RESOLVED that the Task Force shall be composed of the following members, or a designee appointed by the respective member serving by virtue of position:

- (a) The Secretary of the Department of Education;
- (b) The Special Education Officer of the Department of Education;

- (c) The Governor shall appoint one member with expertise in business, technology, or both;
- (d) The Secretary of the Department of Technology and Information;
- (e) The Secretary of the Office of Management and Budget;
- (f) The Controller General;
- (g) The Chair of the Senate Education Committee;
- (h) The Chair of the House Education Committee;
- (i) One member of the State Board of Education;
- (j) Four members appointed by the Delaware Chiefs Association with at least 2 of the members from districts participating in the BRINC consortium;
- (a) One member of the Digital Learning Cadre appointed by the Secretary of Education;
- (b) One member appointed by the Governor's Advisory Council for Exceptional Citizens;
- (c) One school leader appointed by the Delaware Association of State Administrators;
- (d) Two educators appointed by the Delaware State Education Association that have a strong background in using technology in the classroom;
- (e) One educator appointed by the Charter School Network that has a strong background in using technology in the classroom;

BE IT FURTHER RESOLVED that Educational Technology Taskforce shall be administered with staff support using the resources of the Department of Education and the Department of Information and Technology. A representative of the Department of Education shall act as Chair of the Task Force. The Task Force shall convene its first meeting no later than 60 days after enactment and shall meet every other month thereafter. The Task Force shall report and present its findings by March 30, 2016 to the Chair and members of the Bond Committee, the Joint Finance Committee and the House and Senate Education Committees.

SYNOPSIS

This resolution establishes a Task Force on State Educational Technology. The Task Force will review how technology is used in public education classrooms. The Task Force must make certain determinations and issue recommendations. A Task Force report shall be completed by March 30, 2016.

Author: Senator Townsend

Appendix B: Teacher Survey

Section One: Demographics

- 1.1 In which district do you currently teach?
- 1.2 What is the name of your school? (Please type the entire "official" name)
- 1.3 Are you?
- A regular classroom teacher
 - A "specials" teacher such as PE, music, art, etc.
 - A special education teacher
 - A Librarian
 - A Guidance Counselor
 - Nurse
 - Paraeducator
 - Other
- 1.4 How many years have you been in the teaching profession?
- 1 - 5
 - 6 - 10
 - 11 - 15
 - 16 - 20
 - 21 or more
- 1.5 What grade level(s) do you teach?
- Early Childhood (Ages 3-5)
 - Elementary School (K-5)
 - Middle School (6-8)
 - High School (9-12)
 - Other
- 1.6 Where did you earn your Bachelor's degree?
- Delaware State University
 - University of Delaware
 - Wilmington University
 - Wesley College
 - Delaware Technical and Community College
 - An Institution outside the state of Delaware
 - NO Bachelor's Degree
- 1.7 Have you earned an advanced degree?
- Masters
 - Doctorate
 - No advanced Degree

-
- 1.8 Your advanced degree was earned was from...
- Delaware State University
 - University of Delaware
 - Wilmington University
 - Wesley College
 - Delaware Technical and Community College
 - An Institution outside the state of Delaware
 - No Advanced degree
 - Currently enrolled in an advanced degree program
- 1.9 How would you rate your level of computer experience?
- Non-user
 - Novice
 - Intermediate
 - Experienced
- 1.10 How would you rate your level of technology integration into student learning?
- Multiple times per week
 - Once a week
 - Few times a month
 - Few times a year
 - Not at all
- 1.11 Estimate how many hours of technology professional development you have received within the past two years.
- 0 - 4 hours
 - 5 - 10 hours
 - 11 - 20 hours
 - More than 20 hours
- 1.12 How often do you use a computer at home?
- Once a day
 - Once a week
 - Few times a month
 - Few times a year
 - Not at all
- 1.13 I use a computer for the following activities... (check all that apply)
- Word Processing
 - Drill/Practice
 - Solve Problems and Analyze Data
 - Create Instructional Materials
 - Record Keeping and Grade Book
 - Lesson Plans
 - Internet
 - Communication with Students

-
- Communication with Parents
 - Presentations
 - Administering Assessments
 - Entering or viewing Individual Education Plans (IEPs) or parts of the IEP relevant to your interactions with the student
 - Accommodations/Access to Curriculum
 - Blended "Personalized" Learning
- 1.14 What types of technology training have you participated in previously? (Check all that apply)
- Assistive Technology
 - Basic Computer Use
 - Software Applications
 - Use of Internet
 - Integration of Technology
 - Follow-Up Training Sessions
 - Blended "Personalized" Learning
 - None
- 1.15 What are "TWO" ways you learn best on how to use technology?
- Independently
 - Small Group/One-on-One Professional Development Activities
 - Colleagues
 - Students
 - College or graduate work
 - Large Group Professional Development Activities
 - Online Professional Development Modules
- 1.16 Do you teach in a classroom designed for technology (meaning at least a computer for every three students and a SmartBoard or another computer-related learning device)?
- Yes
 - No
- 1.17 Which of the following technologies do you have access to in your classroom?
- Assistive Technology
 - Personal computers or laptops
 - Television/DVR
 - Projectors
 - Interactive white board
 - Handhelds (including cell phones, smart phones, iTouch ...)
 - Tablets/electronic readers (iPad, Kindle, etc.)
 - Interactive table (Smart table)
 - Game devices (Nintendo DS, Kinect, Wii, etc.)
- 1.18 For each technology device listed, please select the ratio of unit/devices to teacher/students in your classroom.

Response Legend: 1 = One device for every student 2 = One device for every two-five students 3 = One device for every six-ten students 4 = One device for every eleven-fifteen students 5 = One device for teacher and one device shared for all students 6 = One device shared by teacher and all students 7 = One device for teacher's use only

Game devices (Nintendo DS, Kinect, Wii, etc.)	1	2	3	4	5	6	7	N/A
Personal Computer or Laptops	1	2	3	4	5	6	7	N/A
Handhelds (including cell phones, smart phones, iTouch devices)	1	2	3	4	5	6	7	N/A
Tablets/ electronic readers	1	2	3	4	5	6	7	N/A
Shared Laptop Carts	1	2	3	4	5	6	7	N/A

- 1.19 This past school year, how many students, on average, do you have in your classroom at one time?
- 0
 - 1-10
 - 11-20
 - 21-30
 - 30+

Section Two: Skills and Knowledge

- 2.1 Which of the following resources do you currently use to enhance and support your teaching efforts/demands of your position?

- Assistive Technology
- Online Lesson Plans
- Web-based interactive games or activities
- Website to deliver/manage class information to parents/students
- Online articles tied to instruction
- Online images
- Online video content
- Online professional development
- Google Maps/Google Earth
- Online community discussion forums for teachers
- Cloud Storage
- Social Media
- Mobile Apps
- Blogs
- Podcasts
- None of these

- 2.2 For each of the following technologies, please select how they are used MOST FREQUENTLY in your classroom/position.

Response Legend: 1 = Management tool used by teacher/educator 2 = Teaching tool used by teacher/educator 3 = Self-directed learning tool used by students

Interactive white board (e.g., SMART Board)	1	2	3	N/A
Interactive table (e.g., SMART Table)	1	2	3	N/A
Personal computers or laptops	1	2	3	N/A
Tablets/electronic readers (iPad, Kindle, etc.)	1	2	3	N/A

Handhelds (including smart phones, iTouch devices)	1	2	3	N/A
Game devices (e.g., Nintendo DS, Kinect, Wii, etc.)	1	2	3	N/A
Projector (to display/show media from websites/browser)	1	2	3	N/A
Television/DVR	1	2	3	N/A

2.3 The amount of time you spend working with Applications and Internet to enhance student learning.

Response Legend: 1 = Never 2 = Yearly 3 = Monthly 4 = Weekly 5 = Daily

Internet for developing lesson plans/ideas	1	2	3	4	5
Apps for tablets	1	2	3	4	5
Assistive Technology Tools	1	2	3	4	5
Test Preparation	1	2	3	4	5
Web Design	1	2	3	4	5
Management programs for student data	1	2	3	4	5

Section Three: Opinions and Attitudes

3.1 Which of the following benefits have you seen with your students in your classroom due to the use of educational technology? (Check all that apply)

- Able to access curriculum more effectively
- Able to reinforce and expand on content being taught
- Able to increase student motivation to learn
- Able to respond to a variety of learning styles
- Able to demonstrate something I can't show any other way
- Able to make students more technology-literate
- Able to provide additional practice to struggling learners/students
- Able to change the pace of classroom work
- Able to teach current events and breaking news
- None of these
- Not Applicable

3.2 Which of the following statements describe how you feel about the use of educational technology in the classroom today? (Check all that apply)

- The technology today allows teachers to do much more than ever before
- Technology is a new and exciting way of communicating with and motivating students
- Kids today are digital natives; we need our classrooms to embrace a 21st century curriculum
- Technology is a motivating and useful tool, but should not be overly relied upon
- Technology is a teaching aid that would be hard to live without
- Technology has a noticeable impact on student learning
- Students are able to harness the power of the technology that kids are already surrounded by and using it for educational progress
- Technology creates an environment of greater student collaboration
- I used to be skeptical about digital media benefits, but am now a strong supporter
- Technology is becoming more of a crutch than it ought to be
- Technology is more of a distraction than an teaching asset
- Technology requires too much planning/maintenance

- None of these
- 3.3 Please choose the statement that best applies to your current thinking.
- I wish we had more technology in my classroom/our classrooms.
 - I wish we had less technology in my classroom/our classrooms.
 - My students/our students want more technology in the classroom but I do not.
 - The level of technology we have now is just fine.
- 3.4 Which of the following uses do you feel are most beneficial to student learning?
(Check all that apply.)
- Educational apps
 - Educational websites
 - E-books/textbooks
 - At-desk individual research and activities
 - Group exercises and assignments
 - Motivating reinforcer
 - Modifications/accommodations for students with IEPs
 - Cloud storage access (Google Docs, Dropbox, etc.)
 - Support for motor-impaired or language-impaired students
 - Photos/videos
 - Other
- 3.5 Have you asked for more technology resources for your classroom?
- Yes
 - No
- 3.6 As new technology becomes available for the classroom, which of the following describes how you feel? (Check all that apply)
- We need to use all the tools available to us – embracing a 21st-century curriculum that will prepare kids for the future.
 - I feel comfortable experimenting with new technology as it becomes available I like new technology, but I wish had more direction on how to use it
 - I like the idea of using new technology, but often the kids know more than I do
 - Technology helps me collaborate as a professional with other teachers
 - I wish we had a special department whose sole job is to help support us on technology
 - Technology increases the needed skill of collaboration among students
 - Traditionally we avoided screen time in the classroom, but today the use of the right educational technology enhances learning.
 - I am just getting used to using older technology and it can be overwhelming to keep up with new developments
 - It would require too much planning/maintenance
 - None of these

3.7 If you received a grant that could be put towards any one technology you wanted in the classroom, what would it be? For the purpose of this question, please assume you do not currently have any of these technologies.

- Interactive White Board
- Pads/tablets for each child
- Computer/laptop for each child
- Interactive table (e.g. Smart Table)
- Projector (to display/show media from websites/browser)

3.8 Please rate each of the following technologies based on your understanding of each to enhance learning (whether these devices are currently used in your classroom or not).
Response Legend: 1 = Does not enhance 2 = Somewhat enhances 3 = Very much enhances 4 = Extremely enhances

Interactive white board (e.g., SMART Board)	1	2	3	4	N/A
Interactive table (e.g., SMART Table)	1	2	3	4	N/A
Personal computers or laptops	1	2	3	4	N/A
Tablets/electronic readers (iPad, Kindle, etc.)	1	2	3	4	N/A
Handhelds (including smart phones, iTouch devices)	1	2	3	4	N/A
Game devices (e.g., Nintendo DS, Kinect, Wii, etc.)	1	2	3	4	N/A
Projector (to display/show media from websites/browser)	1	2	3	4	N/A
Television/DVR	1	2	3	4	N/A

3.9 How often would you say you use each of the following technologies for teaching and learning?

Response Legend: 1 = Less than Once a Month/Never 2 = At least 1-3 times per month 3 = At least once a Week (net) 4 = Everyday

Interactive white board (e.g., SMART Board)	1	2	3	4
Interactive table (e.g., SMART Table)	1	2	3	4
Personal computers or laptops	1	2	3	4
Tablets/electronic readers (iPad, Kindle, etc.)	1	2	3	4
Handhelds (including smart phones, iTouch devices)	1	2	3	4
Game devices (e.g., Nintendo DS, Kinect, Wii, etc.)	1	2	3	4
Projector (to display/show media from websites/browser)	1	2	3	4
Television/DVR	1	2	3	4

3.10 Are you using these educational technologies more frequently, the same, or less frequently than a year ago?

Response Legend: 1 = Not Applicable 2 = Less Frequently 3 = Same Frequency 4 = More Frequently

Interactive white board (e.g., SMART Board)	1	2	3	4
Interactive table (e.g., SMART Table)	1	2	3	4
Personal computers or laptops	1	2	3	4
Tablets/electronic readers (iPad, Kindle, etc.)	1	2	3	4
Handhelds (including smart phones, iTouch devices)	1	2	3	4
Game devices (e.g., Nintendo DS, Kinect, Wii, etc.)	1	2	3	4
Projector (to display/show media from websites/browser)	1	2	3	4
Television/DVR	1	2	3	4

3.11 When using the internet...

Response Legend: 1 = Strongly Disagree 2 = Disagree 3 = Neither Disagree or Agree 4 = Agree 5 = Strongly Agree

Students create products that show higher levels of learning	1	2	3	4	5
There are more discipline problems	1	2	3	4	5
Students are more motivated	1	2	3	4	5
Students go to inappropriate sites	1	2	3	4	5
There is more student collaboration	1	2	3	4	5
Plagiarism becomes a bigger problem	1	2	3	4	5

3.12 I think...

Response Legend: 1 = Strongly Disagree 2 = Disagree 3 = Neither Disagree or Agree 4 = Agree 5 = Strongly Agree

Electronic media will replace printed text within five years	1	2	3	4	5
Most technology would improve my ability to teach	1	2	3	4	5
Technology has changed the way that I teach	1	2	3	4	5
Students are more knowledgeable than I am when it comes to technology	1	2	3	4	5
School systems expect us to learn new technologies without formal training	1	2	3	4	5
There is too much technological change coming too fast without enough support for teachers	1	2	3	4	5
Technology is a good tool for collaboration with other teachers when building unit plans	1	2	3	4	5
Technology is unreliable	1	2	3	4	5

3.13 Please indicate the extent to which you agree or disagree with the following statements as they relate to the professional development in educational technology that you took during the last 12 months.

Response Legend: 1 = Strongly Disagree 2 = Somewhat disagree 3 = Neither Disagree or Agree 4 = Agree 5 = Strongly Agree

It met my goals and needs	1	2	3	4	5	N/A
It supported the goals and standards of my state, district and school.	1	2	3	4	5	N/A
It applied to technology available in my school	1	2	3	4	5	N/A
It was available at convenient times and places	1	2	3	4	5	N/A

Section Four: Preparation/Areas of Improvement/Technical Needs

4.1 I Need...

Response Legend: 1 = Less Urgent 2 = Somewhat Urgent 3 = Urgent 4 = More Urgent 5 = Extremely Urgent

More time to learn to use applications	1	2	3	4	5
More time to integrate technology into my curriculum	1	2	3	4	5
More training to use technology	1	2	3	4	5
More support from administration when it comes to my technology needs	1	2	3	4	5
More technical support to keep computers and applications running	1	2	3	4	5
More access to technology tools to integrate in my classroom instruction	1	2	3	4	5

- | | | | | | |
|--|---|---|---|---|---|
| Faster access to the internet | 1 | 2 | 3 | 4 | 5 |
| More opportunities to collaborate with colleagues on how to use technology | 1 | 2 | 3 | 4 | 5 |
| More options for professional development in the areas of technology | 1 | 2 | 3 | 4 | 5 |
| Help aligning the integration of technology with the implementation of Common Core State Standards | 1 | 2 | 3 | 4 | 5 |
- 4.2 To what extent has each of the following prepared you to make effective use of educational technology for instruction?
Response Legend: 1 = Not Applicable 2 = Not at all 3 = Minor Extent 4 = Moderate extent 5 = Major Extent
- | | | | | | |
|---|---|---|---|---|---|
| Undergraduate teacher education program | 1 | 2 | 3 | 4 | 5 |
| Graduate teacher education program | 1 | 2 | 3 | 4 | 5 |
| Professional development activities | 1 | 2 | 3 | 4 | 5 |
| Training provided by staff responsible for technology support and/or integration at your school | 1 | 2 | 3 | 4 | 5 |
| Independent learning | 1 | 2 | 3 | 4 | 5 |
- 4.3 Do you ever feel restricted when trying to utilize technology in your classroom because of the lack of resources?
- Yes
 - No
 - Not Applicable
 - Other
- 4.4 If you answered YES above, what factors contributed to this?
- Lack of bandwidth
 - Hardware not functioning
 - Blocked content
 - Limited number of devices
 - Lack of training (professional development)
 - Lack of technical support
 - N/A (Answered "No" above)
 - Other

Section Five: Assistive Technology

- 5.1 Please read the following text and respond to the following statements below.
According to the Individuals with Disabilities Education Act of 2004, the term 'assistive technology device' (AT) means any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of a child with a disability.
On a scale of 1 to 5, with 1 indicating strong disagreement and 5 indicating strong agreement, rate the following: Response Legend: =1 = Strongly Disagree 2 = Disagree 3 = Neither Disagree or Agree 4 = Agree 5 = Strongly Agree
- At my school, procedures for all aspects of Assistive Technology assessment, provision and support are clearly defined and consistently applied. 1 2 3 4 5 N/A

- People with appropriate Assistive Technology expertise are available to support the team’s deliberations about Assistive Technology. 1 2 3 4 5 N/A
- At my school, Assistive Technology assessments include a functional assessment in the student’s customary environments, such as the classroom, lunchroom, playgrounds, home, community setting, or workplace. 1 2 3 4 5 N/A
- At my school, Assistive Technology assessments, including needed trials, are completed within reasonable time lines. 1 2 3 4 5 N/A
- At my school, recommendations from Assistive Technology assessments are based on data about the student, environments and tasks. 1 2 3 4 5 N/A
- At my school, the assessment provides the IEP team with clearly documented recommendations that guide decisions about the selection, acquisition, and use of Assistive Technology devices and services. 1 2 3 4 5 N/A
- At my school, Assistive Technology needs are reassessed any time changes in the student, the environments and/or the tasks result in the student’s needs not being met with current devices and/or services. 1 2 3 4 5 N/A
- At my school, the IEP illustrates that Assistive Technology is a tool to support achievement of goals and progress in the general curriculum by establishing a clear relationship between student needs, Assistive Technology devices and services, and the student’s goals and objectives. 1 2 3 4 5 N/A
- At my school, transition plans address Assistive Technology needs of the student, including roles and training needs of team members, subsequent steps in Assistive Technology use, and follow-up after transition takes place. 1 2 3 4 5 N/A
- Professional development has adequately prepared me for my role in assessing students’ Assistive Technology needs and supporting the use of Assistive Technology on an ongoing basis. 1 2 3 4 5 N/A
- The Assistive Technology – related needs of my students are being met. 1 2 3 4 5 N/A
- The policies of my district are clear relative to the provision of Assistive Technology. 1 2 3 4 5 N/A
- My district’s Assistive Technology -related policies are responsive to student needs. 1 2 3 4 5 N/A
- Assistive Technology is always considered when IEPs are developed. 1 2 3 4 5 N/A

Section Six: Your Thoughts...

- 6.1 What technology resource(s) can you share with other Delaware educators that you have found to be most beneficial for you and your students in teaching and learning?
- 6.2 Anything you would like to share that we might have missed?

Appendix C: Infrastructure Survey

1. District / Charter (Local Education Agency (LEA)): _____
2. Does your LEA have any *major technology initiatives* in the planning or implementation stages that may require additional bandwidth? If so, briefly describe initiative(s) including whether you have included funding for bandwidth increases in your planning/budgeting?
 - Yes
 - a. If Yes, _____
 - No
3. How many IT support position FTEs does your LEA use?
 - 1
 - 2
 - 3
 - 4
 - 5
 - 6
 - 7
 - 8
 - 9
 - 10 or more
4. What funding sources are used for IT support positions in your LEA? (Check all that apply)
 - Federal
 - State
 - Local
5. What units are used for IT support positions in your LEA? (Check all that apply)
 - Academic Excellence
 - Custodial
 - Director
 - Paraprofessional
 - Secretarial
 - Supervisor
 - Teacher
 - Other _____
6. Does your LEA currently curtail Internet access (block above and beyond CIPA compliance) to control bandwidth?
 - Yes
 - No

-
7. What brand(s) of wireless does your LEA use (check all that apply)?
- Aerohive
 - Aruba
 - Cisco
 - Meraki
 - Meru
 - Ruckus
 - Other _____
8. What percent of the devices in your LEA connect via wireless?
- 0% - 10%
 - 11% - 25%
 - 26% - 50%
 - 51% - 75%
 - 75% - 100%
9. Since e-rate modernization emphasizes wireless access in the classroom, would your LEA consider participating in a statewide RFP and associated award with the intent of reducing costs of wireless access in your school(s)?
- Yes
 - No
10. Do you want to allow, for the purpose of BYOD, students and/or staff to connect personal devices to your network? Y/N
- Yes
 - No
11. In addition to the Acceptable Use Policy, does your LEA have a Cyber Security Policy that addresses BYOD and wireless initiatives?
- Yes
 - No
12. What, if any, cloud computing is your LEA using or considering? Please describe.
- _____
13. Did your LEA apply for e-rate Category 2 services in the first year (July 1, 2015 – June 30, 2016) of e-rate modernization?
- Yes
 - No

-
14. How is your LEA using or planning to use the Federal e-rate modernization funding (\$150 per student per school over 5 years) over the next 4 years (we are approaching the year 2 application window)? (Check all that Apply)
- Internal Connections
 - routers
 - switches
 - wireless access points
 - internal cabling
 - racks
 - wireless controller systems
 - firewall services
 - uninterruptable power supply
 - caching functionality
 - software supporting internal connection components
 - Basic Maintenance
 - Managed Internal Broadband Services (Managed Wi-Fi)
 - Not planning to use
15. Would your LEA be willing to allocate a portion of Federal e-rate modernization funding for infrastructure upgrades, i.e., switches, internal fiber runs, associated with bandwidth increases?
- Yes
 - No
16. What percentage of your students have access to broadband services at home?
- 0% - 10%
 - 11% - 25%
 - 26% - 50%
 - 51% - 75%
 - 75% - 100%

Appendix D: Annual Delaware School Technology Survey

2015-2016 Annual Delaware School Technology Survey: Snapshot on October 31, 2015

School	<input type="text"/>	SchoolCode	<input type="text"/>	DCAS School	<input type="text"/>
District	<input type="text"/>	DistrictCode	<input type="text"/>		
Contact Person	<input type="text"/>				
Contact eMail	<input type="text"/>				

In addition to collecting data on Administrative Computers and Tablets, other Internet access devices, and other technology devices found in schools, all Instructional Computers in the school needs to be included on this form. Only include computers and tablets that meet or exceed the Smarter Balanced minimum specs.

Computers	Classroom	Computer Lab	LMC	Other Instructional	Assessment Only	Administrative
PC	<input type="text"/>					
PC Laptop	<input type="text"/>					
Mac	<input type="text"/>					
Mac Laptop	<input type="text"/>					
Chromebook	<input type="text"/>					
Other	<input type="text"/>					

Servers	<input type="text"/>
Wireless Access Point Permanent	<input type="text"/>
Wireless Access Point Portable	<input type="text"/>
Classrooms	<input type="text"/>
Classrooms with Computer	<input type="text"/>
Classrooms with Audio	<input type="text"/>
Printers	<input type="text"/>
Digital Cameras	<input type="text"/>
Projection Permanent	<input type="text"/>
Projection Portable	<input type="text"/>
Interactive White Board Permanent	<input type="text"/>
Interactive White Board Portable	<input type="text"/>
Interactive White Board Table	<input type="text"/>
Document Camera	<input type="text"/>
Response System	<input type="text"/>
Microsoft EES Agreement	<input type="text"/>

Other Internet Access Devices	Instructional	Administrative
Android Tablet	<input type="text"/>	<input type="text"/>
iPad	<input type="text"/>	<input type="text"/>
Windows Tablet	<input type="text"/>	<input type="text"/>
Mobile Device	<input type="text"/>	<input type="text"/>
Portable Media Player	<input type="text"/>	<input type="text"/>
eBook	<input type="text"/>	<input type="text"/>
Other	<input type="text"/>	<input type="text"/>

Students	<input type="text"/>
Teachers	<input type="text"/>
Administrators	<input type="text"/>
Survey Status	<input type="text"/>

Appendix E: Educational Technology Goals, Strategies, and Recommendations

Goal 1 – Leadership

The state will have an oversight organization to provide strategic guidance for educational technology for the state and LEAs.

Strategies

1. Form the Council on Educational Technology with the following responsibilities:
 - a. Needs Assessment – Establish a process for identifying ongoing technology and human resource needs at the classroom, campus, district and state levels, including a technology inventory.
 - b. Policy – Based upon the needs assessment and other considerations, recommend policy annually.
 - c. Budget – Recommend a budget for statewide educational technology expenditures annually.
 - d. Planning – Develop ongoing (three-year) strategic plans for the state that “mesh” with other planning efforts at the Department of Education (DDOE), the Department of Technology and Information (DTI), and other agencies and develop a framework and process for local planning that coordinates with other plans at the local level as well as the state strategic plan.
 - e. Safety and Security – Define a statewide acceptable use policy and procedures and a process to ensure all educators and students agree to the policy; ensure all LEAs are compliant with the federal regulations including the Children’s Internet Protection Act (CIPA), Children’s Online Privacy Protection Act (COPPA), and Family Educational Rights and Privacy Act (FERPA).
 - f. Procurement – Work closely with the Government Support Services to establish a focal point within education for the preparation of technology-related RFPs, vendor negotiations, and site licenses for software specific to education to optimize costs through consolidating demand.

Recommendation 1.1.1: *Present Legislation to form the Council on Educational Technology that will be supported with staff from the DDOE and DTI. The Council should meet quarterly and have no more than 15 members comprised of stakeholder representatives from across the state.*

Goal 2 – Broadband and Support

The statewide network core that provides and supports broadband access and internal networks to all Delaware public schools will be maintained and grown by providing continuous improvement and expansion of the infrastructure to meet the needs of the education community.

Strategies

1. Provide the necessary resources to ensure that the network core, broadband access, Internet access, and associated services provided by the Department of Technology and Information continually align with the State Educational Technology Directors

Association (SETDA) recommendations from *The Broadband Imperative* that are incorporated into the Federal Communications Commission (FCC) E-rate modernization order as a goal.

Recommendation 2.1.1: *Ensure all elementary schools have sufficient resources to support a capacity of 100 Mbps bandwidth and all middle and high schools have sufficient resources for 1 Gbps (1,000 Mbps) for the 2016-2017 school year as well as associated increases at the network core to support the bandwidth increase.*

Recommendation 2.1.2: *In FY18, provide sufficient resources to increase bandwidth in all schools to 1 Gbps (1,000 Mbps) to align to the SETDA/FCC guidelines for the 2017-2018 school year.*

Recommendation 2.1.3: *Beginning in FY19, DTI and DDOE will conduct an annual evaluation of bandwidth requirements by school and bandwidth adjusted to ensure alignment with SETDA and FCC guidelines.*

2. Ensure adequate resources so that internal school networks, including wireless access, have a replacement cycle of 5–7 years that takes advantage of the funding cycle of Category 2 of the E-rate modernization order.

Recommendation 2.2.1: *Provide sufficient resources from the state to ensure all LEAs are able to take maximum advantage of Category 2 of the E-rate.*

Recommendation 2.2.2: *Explore the possibility of working with the Public Service Commission and the Legislature to establish a Delaware Universal Services Fund for E-rate, not unlike the Delaware Broadband Fund.*

3. Ensure that LEAs have adequate resources and trained personnel to support and maintain their devices, internal networks and broadband coming into the schools.

Recommendation 2.3.1: *As the state provides flexibility in funding streams, the LEAs need to determine sufficient technology staffing to support the networks and devices in the LEA, with an initial target of one FTE per 500 devices.*

4. Enter into partnerships with telecommunications providers, carriers and appropriate agencies of the state to ensure every part of the state has sufficient broadband to support students at home.

Recommendation 2.4.1: *Encourage the Council on Educational Technology to form a working group to further delve into the best path forward to ensure robust broadband connectivity in the community and homes.*

Goal 3 – Computing Devices

By the 2019-2020 school year, all students will have access to a computing device at school and at home, to enhance learning and provide them with technology skills and savvy.

Strategies

1. Negotiate a state contract with volume purchasing power for multiple types of devices that districts can access. The contract should include options for professional learning, technology support, and provisions for full accessibility for the benefit of all students and educators with disabilities.

Recommendation 3.1.1: *Form an RFP committee consisting of representatives from DTI, DDOE and the LEAs to determine the criteria for an RFP and issue an RFP that will be awarded by spring 2017.*

Goal 4 – Teacher Preparation

By 2020, all students graduating teacher preparation programs in Delaware will be confident and effective in using technology to enhance students' learning experiences as illustrated by the ISTE Standards for Teachers.

Strategies

1. Ensure teacher preparation programs prepare students entering the teaching profession with the necessary skills to effectively integrate technology into students' learning experiences and offer advanced degrees/certificates for practicing teachers.

Recommendation 4.1.1: *The Delaware Professional Standards Board in tandem with the State Board of Education should consider adopting either a credit minimum or competency based requirement around the integration of technology into learning for teacher candidates seeking an initial license.*

Recommendation 4.1.2: *Teacher Preparation programs should be encouraged to offer advanced degrees or certificates on teaching and learning with technology and blended learning to personalize instruction for practicing educators.*

Goal 5 – Professional Learning

Practicing educators in Delaware will be confident and effective in integrating technology to enhance students' learning experiences as illustrated by the Interstate Teacher Assessment and Support Consortium (InTASC) and the ISTE Standards for Teachers and consistent with PSB Regulations 1598 and 1599 and following.

Strategies

1. Adopt and implement the International Society for Technology in Education (ISTE) standards for students and coaches.

Recommendation 5.1.1: *The Delaware Professional Standards Board and the State Board of Education should expand Regulation 1599 beyond standards for teachers and administrators by adopting the ISTE Standards for Students and ISTE Standards for Coaches.*

2. Establish an LEA Digital Learning Coach position to support educators in effectively implementing digital learning to fulfill the ISTE standards.

Recommendation 5.2.1: *Ensure LEAs have sufficient resources to support a minimum of one digital learning coach per LEA and for larger LEAs, sufficient digital learning coaches to address the needs and vision of the LEA.*

3. Provide online personalized professional learning, research, and collaboration opportunities for educators that are tied to practice and aligned to ISTE standards through an online virtual network.

Recommendation 5.3.1: *Provide online personalized professional learning, research, and collaboration opportunities for educators that are tied to practice and aligned to ISTE standards through an online virtual network.*

4. Establish and maintain a “Leading in the Digital Age” on-going, sustained, professional learning program for teacher leaders, principals, superintendents, and other education leaders.

Recommendation 5.4.1: *Establish and maintain a “Leading in the Digital Age” on-going, sustained, professional learning program for teacher leaders, principals, superintendents, and other education leaders.*

Goal 6 – Blended Learning to Personalize Instruction

Students and educators will have access to a statewide online virtual network that will include digital resources and data analysis capabilities to deliver blended learning to personalize instruction for students.

Strategies

1. Provide LEAs with the opportunity to purchase licenses at a low cost for a statewide learning management system for use with K-12 students that is integrated with the statewide pupil accounting system.

Recommendation 6.1.1: *Maintain a statewide contract for a learning management system and ensure a per student cost-share between the Department of Education and the LEAs.*

2. Establish a repository as part of the statewide online virtual network with processes to develop, manage and assess instructional resources, including Open Educational Resources and expand current initiatives to include curriculum subscriptions.

Recommendation 6.2.1: *Provide resources and personnel sufficient to build and support a statewide repository for instructional resources.*

3. Provide resources and professional learning so that by the 2019-2020 school year, the majority of resources used in Delaware grades 3–12 classrooms are digital and are accessible for all students, including students with disabilities who may use assistive technologies to access their learning materials.

Recommendation 6.3.1: *Conduct a detailed analysis of Delaware code, regulations, and policies to ensure there are no barriers to purchasing digital resources with existing funding streams for textbooks and instructional materials.*

Recommendation 6.3.2: *Provide sufficient resources and professional learning so that by the 2019-2020 school year, the majority of resources procured and used in Delaware grades 3–12 classrooms are digital and fully accessible.*

Goal 7 - Assistive Technology: Students

Ensure all students, including students with disabilities, will have access to technology that will help them learn and achieve.

1. Create and adopt uniform guidance addressing assistive technology consideration, access and support for children with disabilities ages birth through 3.

Recommendation 7.1.1: *Develop and promulgate Delaware Assistive Technology Guidelines that specify expectations regarding the processes by which assistive technology is considered, assistive technology needs are evaluated, assistive technology is acquired and customized, and children and families are supported in using AT to enhance access to and participation in routines and activities.*

2. Create and adopt uniform guidance addressing assistive technology consideration, access and support for preschool, elementary, and secondary students with disabilities, ages 3 through 21.

Recommendation 7.2.1: *Develop and promulgate Delaware Assistive Technology Guidelines that specify expectations regarding the processes by which assistive technology is considered, assistive technology needs are evaluated, assistive technology is acquired and customized, and students are supported in using assistive technology to learn, demonstrate their abilities, and transition successfully into adult life.*

Recommendation 7.2.2: *Develop and promulgate guidance that specifies expectations regarding the procurement of accessible educational technology and the processes for ensuring compatibility among infrastructure, hardware, and software so that students with disabilities have contemporaneous access to the same learning opportunities as their peers without disabilities.*

3. Establish a centralized fund to assist early intervention providers and LEAs in acquiring the assistive technology determined by teams to be necessary for children with disabilities to benefit from early intervention or educational services.

Recommendation 7.3.1: *Clarify, via the Delaware Assistive Technology Guidelines, the range of possible sources supporting AT acquisition and the mechanisms for accessing those sources, and establish a centralized fund to assist in the acquisition of assistive technology, including guidelines for utilization of the fund that reflect the necessity of student-specific assistive technology selection and an expectation of shared state/local obligation.*

Recommendation 7.3.2: *Support the FY18 assistive technology budget request in the work from the Department of Education’s comprehensive review of the delivery of special education services, including assistive technology, authorized by Section 307 of the FY 2015 budget epilogue.*

Goal 8 - Assistive Technology: Educators

All educators will have sufficient knowledge, skills, and dispositions—as well as access to consistent and predictable acquisition mechanisms—to ensure that students with disabilities have access to the AT needed for engagement, learning and skill demonstration.

Strategies

1. Create companion documents to the Individualized Education Plan (IEP) and Individualized Family Service Plan (IFSP) that prompt teams to engage in assistive technology consideration and documentation consistent with federal law and Delaware Assistive Technology Guidance documents.

Recommendation 8.1.1: *Develop and embed electronic assistive technology templates that can be used and appended to hard copies of the IEP/IFSP.*

2. Create and deliver comprehensive professional development to ensure that all educators act in compliance with federal law and the Delaware Assistive Technology Guidelines.

Recommendation 8.2.1: *Create online and face-to-face professional learning opportunities for all members of a child’s IEP/IFSP team. The content should be differentiated for a range of audiences who need varying degrees of detail, and there will also be an overview developed for families and students.*

3. Establish competencies for those serving in assistive technology leadership roles to ensure that all teams have access to adequate assistive technology expertise.

Recommendation 8.3.1: *Devise competencies for those serving in assistive technology leadership roles in the early intervention and educational contexts. The competencies should reference high-quality educational practices, expertise in consultation and facilitation of team processes, and the expectation that those in AT leadership roles will have the dispositions, breadth of knowledge, and depth of skill to support the full range of AT needed by students.*