

Transforming Schools



Guidance on Instructional Technology
Planning and the Smart Schools Bond Act

Imagine a learning environment ...

... where students and teachers have access to content and tools to connect and collaborate anytime and anyplace. Where students have individualized learning paths based on both their specific styles for learning and their interests. Where students collaborate with a global community of students, teachers and others in support of their learning.

Imagine an environment where students ask questions.
Research. Propose solutions. Create. Innovate.

In this environment, students are empowered and drive their learning. They learn independently and with a group of “critical friends” from within the school, across the community and around the world.

In this environment, learning is relevant and applicable. Here, students can make direct connections between what they are learning and their own lives.

In this learning environment, students strive to succeed, but use failures as opportunities for growth. Here, students’ well-being is paramount and nurtured and protected so that true learning can take place. [Click here](#) to explore this environment.

Do your schools look like this today?

The Smart Schools Bond Act was approved by New York’s voters in November 2014 and offers districts an opportunity to transform schools to prepare learners for a world not yet imagined. But, how can we reimagine and go about transforming our schools and our classroom spaces to provide this environment for our students? What changes need to occur in terms of physical, virtual and blended instructional design to promote collaboration, problem-solving, innovative thinking and creativity within a safe, sustainable, technology-rich environment?

Click on the icons to explore how you can transform education in your schools:



Curriculum, Pedagogy & Assessment

Infrastructure, Security & Technology

Leadership, People & Culture



Click the “deep dive” icon, or text boxes, found throughout this publication for a more in-depth exploration of the topics.



The new classroom

[hover over shaded terms for more information]

In a transformed school, the classroom is not defined by the walls of a single physical space. The new classroom is everywhere. In this environment, what would a day in the life of a student look like if we took full advantage of new technologies for teaching and learning?



Follow this student as she...

Prepares for the day by using her personal device to log in to the school's portal/virtual space to review schedules, activities and deadlines.

She heads to school on the bus. The bus is not just transporting students to school, it's a portable learning environment. She uses her personal device to connect to her virtual space to work on an individual assignment or to connect with others around a joint project.

Once at school, she interacts with other students, with teachers and with other school staff. This may happen in classrooms, in libraries, in the lunchroom, in the hallway or in a virtual space.

When she enters a classroom, the room looks much different than the day before, the week before, the month before. Furniture is flexible and aligned to the learning activities that day.

Today starts with a full-class activity. The teacher takes students through preliminary exercises on the room's presentation system, with students following along on their personal devices within the school's virtual space.

Now the teacher directs students to gather in smaller groups physically within the room and virtually in online spaces. Within this space, our student collaborates on a project. She connects with another classroom via video to further inform the project. She consults with others in the group



about whether this project will be a written document, a video, a slide presentation, a digital story or a combination of these. Because the teacher is working with another group, our student sends a meeting request to her teacher. Her team schedules another collaborative session for 8 p.m. that evening, where she will connect via their virtual space from home to continue project development.

On her way to her next class, she is pinged that the essay she submitted online is graded and available with feedback from her instructor. Because her school can't offer an instructor for this specialized class, she works with a teacher and classmates from another school district via distance learning technology. She speaks with the teacher and fellow students in the class through interactive video on a series of large flat-panel displays. All students in the class are using their personal devices to connect online.

She generates ideas. Creates. Innovates.

During unassigned time, she visits a **makerspace** to collaborate with classmates about a school navigation app she is creating.

As she enters her final class, held in conjunction with community members from a local business, she prepares to present findings about field testing done to support a new product under development by the business. She uses her personal device to present wirelessly to the space's presentation system. Her resources are housed in the school's virtual space. During the presentation, she annotates key points in the presentation from her personal device. Her fellow students in the presentation are handling questions from other students and community members, located both physically in the room and virtually within the online space.

Basketball practice moved to the lower gym? She receives a push notification, so she knows she is headed to the right location.

While she is at school, her parents review the **digital portfolio** of all of the projects and activities she is working on. Her parents reference resources available to them via the **school's portal** in preparation for helping their daughter when everyone is home that evening.

At home, she reviews a lab demonstration from within the school portal that had been previously recorded by her teacher. This activity is in preparation for a project to be conducted in tomorrow's class. She is also reminded on her personal device to connect into the previously scheduled 8 p.m. online meeting with her small group.

Establishing a new vision and new models for learning

To establish the new classroom, district leaders must start with a very basic question:

“How do you envision students learning in your school?”

Then closely follow up with these questions:

“What technologies will help make this type of learning more achievable?”

“Through what pedagogical design?”

Answers to these questions will inform districts about changes they need to make in student learning spaces. New technologies and learning models provide districts with opportunities to transform learning spaces and foster the district’s vision for student learning.

In the “new classroom,” spaces for learning become:

- **Intertwined and interconnected.**
- **flexible, evolving, repurposed and adaptive.** Any space can be transformed into a learning environment, allowing for a combination of large-group, small-group and individualized learning activities. Old spaces are transformed for new purposes (for example, a computer lab evolves into a makerspace).
- **Virtual.** Online hubs/networks of synchronous (same time) and asynchronous (different time) activities and resources.
- **Community-based.** School is the center of the community and serves as an information and collaboration hub.
- **Global.** Learners connect and collaborate with resources beyond the school and local physical community.
- **Omnipresent.** Learning time and space is extended beyond the traditional school day into homes and communities.

Curriculum

Designing education to meet the needs of society is a top priority of our education systems. “Educated workers need a conceptual understanding of complex concepts, and the ability to work with them creatively to generate new ideas, new theories, new products and new knowledge.” – Organization for Economic Cooperation and Development (OECD)

In addition to defining the transformed space, districts must define the transformation of curriculum, pedagogy and student assessment beyond compliance and into a culture of innovation.

Schools must re-imagine their program of study to build a connective ecology of learning where knowledge is created and built.

Students, teachers and administrators are not just active participants within a school



building but are connected with engineers, researchers, policy-makers and other global community stakeholders to provide an enhanced curriculum that exceeds existing curriculum standards and expectations. Schools become hubs for innovation.

Building a
connective
ecology
of learning

Pedagogy — the art and science of teaching

Innovative pedagogy prepares students (citizens) of a knowledge society to be creative, achieve change, manage and analyze information and work with knowledge.

A transformed school is a place where learning is transparent within a socio-ecological system.

Learning can happen at any time and in a variety of settings, not just the school building.

All teachers, students and administrators are empowered in a transformed school to become idea-generators, risk-takers, creators and innovators within a community that promotes invention. Teachers and administrators are required to have the same skills they are developing in their students — flexibility, creativity, an ability to work collaboratively and to think innovatively.

10 Ways to Teach Innovation

Some considerations for learning in a transformed school:

Student-centered learning models:

- Teachers are facilitators and look to students for answers as much as students look to teachers for guidance. Students learn from one another, from the teacher and from resources available outside the school walls.
- Learning is personalized and differentiated for each student based on his/her proficiencies, learning styles and interests.
- Competency-based student learning. Time, place and pace are not barriers to learning. Instead, students progress and are assessed on their mastery of content and the development of their skills, not purely on being present in the classroom. Students are active, not passive, learners.

Students:

- Are social scholars;
- Are fluent, flexible, adaptive, tolerant of ambiguity;
- Ask questions, generate ideas, take risks, “sell” their ideas;
- Are co-constructors of knowledge;
- Are empowered and motivated/ independent and autonomous;
- Define and evolve their identity, citizenship and sense of well-being.



Assessment

Realities dictate districts will need to provide some form of standardized assessment of students. However, a transformed school will require additional forms of assessment with the following characteristics:

- ◆ **Based on authentic student work.** Students drive assignments, develop questions, generate ideas, research, develop defensible hypotheses and viewpoints, debate and collaborate with peers and create an original deliverable as an outcome. Students then critically evaluate their own work and peer work for continuous improvement.
- ◆ **Differentiated.** Using multiple formats to demonstrate learning.
- ◆ **Collected and maintained digitally.** Students have digital portfolios to maintain an ongoing collection of their work and projects.



click on
links to the
right

- [Evaluation and Assessment Slideshare](#)
- [Assessment for Learning Formative Assessment](#)
- [Formative Assessment: Improving Learning in Secondary Classrooms](#)
- [Progression in Creativity: Developing New Forms of Assessment](#)

More information about the Pedagogical Model of Learning in a Transformed School:

- [Knowledge-building](#)
- [Conceptual change teaching](#)
[Resource 1](#)
[Resource 2](#)
[Resource 3](#)
- [Designed-based learning](#)
[Resource 1](#)
[Resource 2](#)
- [Competency-based](#)

Emergent Technologies in a Transformed School:

- [Mixed/augmented reality](#)
[Resource 1](#)
- [Scientific data/learning analytics](#)
- [Visualization](#)
- [Online/embedded sensors](#)
- [Open educational resources](#)
- [Virtual and remote laboratory](#)
- [Seamless learning environments](#)
- [Participatory media and networking](#)
- [3-D Printing](#)
- [Robotics](#)

Network infrastructure

The construction of a home, a school or an office begins with careful planning and the building of a solid foundation. The same is true when constructing a transformative technology environment for students. Instead of concrete, bricks and mortar, the technology infrastructure foundation is reliant on critical components that enable high-speed connections between students and educational resources throughout the world. High-speed broadband access, core network infrastructure systems, wired and wireless networking and IT support are the essential building blocks of a scalable technology foundation that enables 21st century learning. As we embark on strategic planning for the appropriate use of Smart Schools funding, these areas should be a primary focus when constructing your technology foundation:

Wireless
Network
Design

[hover over icons for more information]



Broadband Access



Core Infrastructure



Wireless Networking



IT Support

Safety & security



In order for any learning environment to be engaging and productive, a student's basic human needs must first be met. Schools have always worked diligently to meet these needs through such activities as providing child wellness and nutrition programs, designing and updating buildings to be well-lit, properly heated and ventilated and ensuring that proper building codes and insurance recommendations are adhered to in order to mitigate hazardous situations.

Schools today, however, have a whole new level of responsibility when it comes to creating and maintaining safe environments. The unfortunate reality is that societal changes have led to a new "normal" in terms of public expectation. Schools that do not have "active shooter" and "lockdown" plans in place are in the minority. Along with this new normal comes questions about the technology and building infrastructure that need to be installed, managed and updated.

Beyond the physical security of learning spaces, districts and their IT staff need to also have well-crafted approaches that will offer students, staff, families, community members and visitors easy and secure access to educational information with a variety of stationary and mobile devices.

[hover over icons for more information]



Access Control



Video Surveillance



Mass Communication



Visitor Management

Creating physically secure schools



Back to basics

The desk phone is usually the first line of defense in any situation, through which a call to 911 or emergency services can be placed. Though not mentioned in the Smart Schools Bond Act, we should not lose sight of the security that a reliable phone system brings to an organization. A hosted Voice over Internet Protocol (VoIP) phone solution, which includes notification to designated staff of the phone extension from which the 911 call was placed, can allow internal personnel to investigate these calls in a timely manner.

There are many questions still outstanding regarding the content, intention and implementation of the Smart Schools Bond Act. What we do know is that the legislation related to Smart Schools specifically mentions school safety in the form of video surveillance, emergency notification systems and physical access controls.

It has been well documented through research that student achievement increases when students are in a safe learning environment. The Smart Schools Bond Act funding will enable schools to introduce or expand an existing video surveillance system that will be a vital component to a safe learning environment.

When embarking on a security project, the first question you should ask is, “What am I securing and why?” This will help you craft the proper solution for your district and building. The next step is to determine what policies and procedures need to be in place to support your solution. Lastly, the district will need to determine the resources needed to sustain such a system from an internal perspective, as well as from an external perspective. This should include proper training of your staff and adequate maintenance agreements on equipment and software.



Creating safety and security around “anytime/anywhere” learning

Anytime/anywhere” learning leverages personally owned mobile devices, such as laptops, iPads, tablets and smartphones, to enhance student learning and meet one-to-one computing trends within tightened school district budgets.

Today’s learning environment is well-connected and has extensive on-demand needs. Anywhere there is a signal, students can be found accessing data from their phones and tablets. These mobile devices embody the blending of technologies [applications, tools, readers, etc.] that very easily lend themselves to education and enhanced learning.

The more information students can access, the more they can learn. Students are increasingly more self-directed and collaborative through their secure use of educational tools and digital content. Critical thinking and problem-solving, creativity and innovation, communication and collaboration — all are skills required for students to be competitive, and all are skills enhanced by “anytime/anywhere” learning.



Creating safer schools

“School safety has to go beyond measuring violence and crime. [Students] need to feel like they are valued [and] belong, and are in a good emotional and psychological state to learn.”

— Kevin Jennings, former assistant deputy secretary for the Office of Safe and Drug-Free Schools, Department of Education

E-rate for broadband in schools and libraries

The Federal Communications Commission (FCC) has developed the Universal Service Program for Schools and Libraries (E-rate) in order to bring affordable broadband connectivity to schools, libraries and communities. This program has also developed guidelines that are recommended to be followed for short-term and long-term planning for broadband connectivity and Internet access bandwidth. These guidelines are based on the

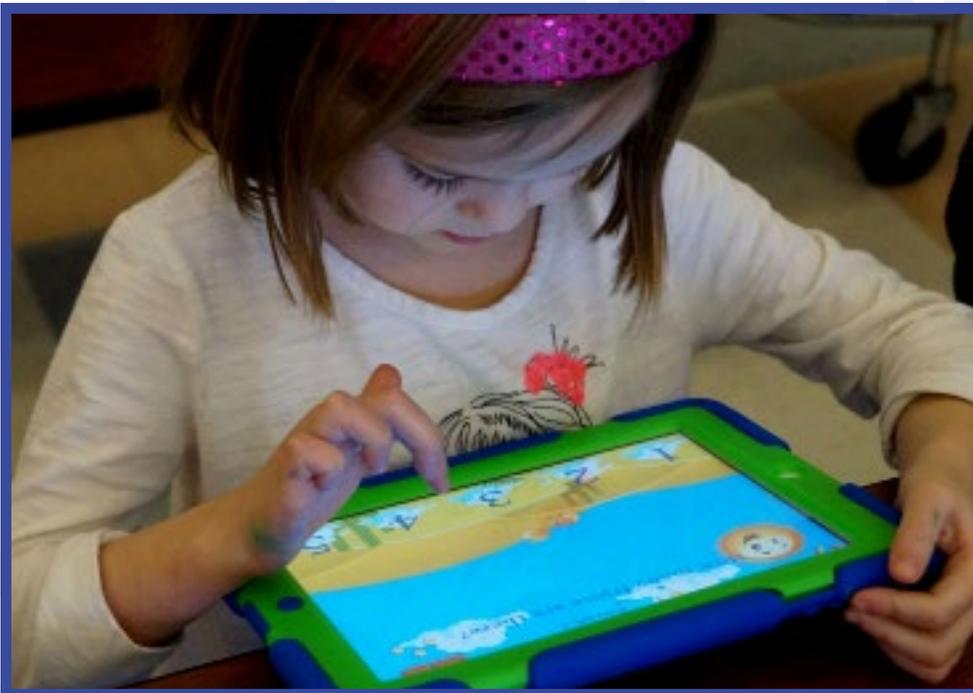
student populations of the schools, along with the population of the community for library connectivity. The short-term recommendation for Internet access bandwidth for each 1,000 school students of a school is 100 megabits per second (Mbps), along with a broadband connection with scalable capacity up to 1 gigabit-ethernet (GbE) or 1,000 Mbps.

What's needed to safely BYOD

Areas to explore and essential questions you need to ask as you create a Bring Your Own Device (BYOD) policy and related strategies in your district:

[hover over icons for more information]

- Wireless access
- Visibility and assessment
- Centralized management
- Real-time identity for mobile devices
- Visitor access to information



Digital citizenship

As access to global resources continues to become more readily available, it is also critically important to focus on Internet safety and ensuring students become good digital citizens. While this new infusion of technology provides countless new opportunities for learning, it also creates far-reaching safety concerns. Providing guidance on the student's digital footprint in regard to their online activity is an important factor to emphasize. For example, providing students with information on choosing secure passwords and guidance on what information is appropriate to share with the world are essential components of responsible Internet access. Educators, parents and families play an important role in helping to build exemplary online habits for our students. Valuable information and resources to assist can be found at OnGuardOnline.gov, which is the federal government's website to help individuals be safe, secure and responsible online.

We are educating students in a time of globalized relationships, innovative social/educational technologies and accelerating change. Given this reality, it is essential to make a shift that will truly transform schools, the learning that happens for students and the ways we help prepare them now for the vibrant and digital world they live in, learn in and will eventually work in at jobs that have yet to be imagined.

Making “shift” happen in your schools

So, how do you transform your schools into “smart schools” that will best meet students’ needs, now and into the future? Where do you start?

While the appeal of a significant infusion of additional financial resources related to the Smart Schools Bond Act has many considering what to buy first, “things” should probably be one of the very last considerations if you truly want to transform the educational landscape in your schools.

As suggested in the introduction, it is good to start with a vision of what a student’s day will look like in your smart schools. That’s how the planning begins. In order to do this, key stakeholders must be involved from day one.

As you work through the process, communication with all stakeholders is key.

Once a vision has been agreed upon, clearly scripted and attainable time-lines need to be established. It is at this point that all purchasing related to your vision can be discussed and planned.

Finally, it is most important to define what attaining your goals will look like and how you can measure success ... all while planning for the next steps in a rapidly changing world.



School 3.0

School 3.0 is a relatively recent development in education. It is designed to equip learners with the skills they will need to learn and succeed in a world that is increasingly fast-paced and technological. It requires students to use creativity when accessing the abundance of free information available using tech tools.

Essential conditions

The International Society for Technology in Education (ISTE) has outlined 14 essential conditions/critical elements necessary to effectively leverage technology for learning. The organization offers educators and school leaders a research-backed framework to guide implementation of the ISTE Standards, tech planning and system-wide change. These include:

- **Shared Vision**
Proactive leadership develops a shared vision for educational technology among all education stakeholders, including teachers and support staff, school and district administrators, teacher educators, students, parents and the community.
- **Empowered Leaders**
Stakeholders at every level are empowered to be leaders in effecting change.
- **Implementation Planning**
All stakeholders follow a systematic plan aligned with a shared vision for school effectiveness and student learning through the infusion of information and communication technology (ICT) and digital learning resources.
- **Consistent and Adequate Funding**
Ongoing funding supports technology infrastructure, personnel, digital resources and staff development.
- **Equitable Access**
All students, teachers, staff and school leaders have robust and reliable connectivity and access to current and emerging technologies and digital resources.
- **Skilled Personnel**
Educators, support staff and other leaders are skilled in the selection and effective use of appropriate ICT resources.
- **Ongoing Professional Learning**
Educators have ongoing access to technology-related professional learning plans and opportunities, as well as dedicated time to practice and share ideas.
- **Technical Support**
Educators and students have access to reliable assistance for maintaining, renewing and using ICT and digital learning resources.
- **Curriculum Framework**
Content standards and related digital curriculum resources align with and support digital age learning and work.
- **Student-Centered Learning**
Planning, teaching and assessment all center on the needs and abilities of the students.
- **Assessment and Evaluation**
Teaching, learning, leadership and the use of ICT and digital resources are continually assessed and evaluated.
- **Engaged Communities**
Leaders and educators develop and maintain partnerships and collaboration within the community to support and fund the use of ICT and digital learning resources.
- **Support Policies**
Policies, financial plans, accountability measures and incentive structures support the use of ICT and other digital resources for both learning and district/school operations.
- **Supportive External Context**
Policies and initiatives at the national, regional and local levels support schools and teacher preparation programs in the effective implementation of technology for achieving curriculum and learning technology ICT standards.

About NERIC

In a geographic service area that covers 12 counties, the North-eastern Regional Information Center (NERIC) partners with seven BOCES to provide advanced technology services to 137 school districts. NERIC provides districts with a broad array of services that apply to multiple facets of district operations, such as instruction, student information, finances, human resources, security and test reporting.

NERIC's trained professionals and technical experts are the key components in our charge to provide comprehensive and highly effective services for school district operations. In order to provide our schools the best technology and application solutions possible for each service and program, every software package we custom-assemble for districts is tested, certified and locally supported.

NERIC deploys dozens of trained and certified technical experts throughout the region who design, install, support and manage



hundreds of school districts' wide-area and local-area networks. All technical support areas, from help desk troubleshooting to technology maintenance, are covered.

In addition, NERIC's instructional staff development offerings give districts the chance to collaborate to further enhance their staff development programs. Emphasis on New York State/Common Core Learning Standards and current courseware are combined with professional training staff to provide high-quality planning and training services our districts have come to depend on.

Questions about how NERIC can help you and those in your district as you work toward transforming your schools and the learning that happens there?



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Under the Smart Schools Bond Act ...

... \$2 billion in funding has been made available to schools to provide access to classroom technology and high-speed internet connectivity to equalize opportunities for children to learn, to add classroom space to expand high-quality pre-kindergarten programs, to replace classroom trailers with permanent instructional space, and to install high-tech smart security features in schools.

District allocations can be found [here](#).
View the Smart Schools Bond Act implementation guidance document [here](#).

Requirements:

- Each district must submit a Smart Schools Investment plan for New York State Education Department (NYSED) approval.
- School districts must develop their investment plan in consultation with parents, teachers, students, community members and other stakeholders.
- Once the Smart Schools Investment Plan is approved, the school district will be eligible to begin receiving grant funds, up to the amount of its Smart Schools allocation amount, to reimburse costs of the approved projects. NYSED will administer the funds.
- NYSED and the governor's office have confirmed that funding for Smart Schools will be distributed through a reimbursement model where the district pays for the technology and then is reimbursed by the state.

Visit the [NERIC Smart Schools resource page](#) for up-to-the-minute news and information about the Smart Schools Bond Act.

