



Successful Technology Integration: A District-wide Initiative

SUMMARY

Take a dedicated, hard-working staff, a union and administrators working collaboratively, give them and their students access to some cutting-edge technology, and you have the key elements in the sweeping transformation of one Hudson Valley school district.

Imagine...

- First-graders practicing sound-symbol relationships on a SMART Table, dragging symbols across a screen and explaining their choices to their classmates;
- A fourth-grade class working together to design, storyboard, produce and broadcast a digital television program for a local TV station;
- A virtual writing lab using blogs in which students give each other constructive feedback;
- A biology review lesson for a high school special education class done entirely through 3-D technology;
- A high school art class focusing on computer fashion design — followed by construction of the fashions in a Home and Careers class; and

- A technology coach available to every teacher in the district, whose responsibility is to support the use of technology in the classroom, regardless of teacher skill level.

If you are either an employee or a student of the Enlarged City School District of Middletown, you do not have to imagine any of this — it is *reality*.

Technology is a key element in the turnaround of the Middletown District. Staff implemented the changes that were necessary to bring the district into the 21st century and alter its District In Need of Improvement (DINI) status. Educational results as reported by student performance scores have radically improved in this district, located in Orange County, 65 miles northwest of New York City. Middletown comprises seven buildings and 6,750 students. The district is quite diverse in terms of culture and ethnicity. The percentage of students

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Sheila Esposito, Middletown Teachers Association

eligible for free or reduced-price lunch is 74%. In addition to the integration of technology, and improved physical settings, the metamorphosis in Middletown can be attributed to a union and administration that work collaboratively.

District-wide Technology PLANNING is the Key

Every school district in New York state is required to submit a Technology Plan to the New York State Education Department to be eligible to receive formula and competitive grants under the Elementary and Secondary Education Act (ESEA) Title II, Part D and other federal funding programs. Middletown's current Technology Plan was developed by a district team that included the superintendent of schools, key technology staff, administrators with responsibility for curriculum and instruction, the union president, teachers appointed by the union, and representatives from both the Board of Education and the community. The Middletown Technology Plan's vision statement frames the district philosophy:

“Powerful information and communications technology (ICT) will strengthen the quality of our teaching, thereby helping us to meet the current academic and social needs of all our students, preparing them for continued personal and educational growth as lifelong learners. We believe that equipping our schools with current technology is important. We know that a well developed and well-supported technology infrastructure will address NCLB, Federal Communications Commission e-rate and New York state learning standards. We will prepare our students for the challenges they will face in the current and future economies, and increase the opportunities that will encourage them to remain members of the Middletown community.”

Even with the best intentions and great ideas, district plans can end up filed in a drawer or placed carefully on a shelf. We in Middletown have not let our Technology Plan meet this fate. We included the essential ingredient of union involvement in the creation of the plan from the beginning.

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Our district Technology Plan emphasizes the following:

- Expanding both teacher and student use of technology, especially targeting the core subjects;
- Sustaining professional development opportunities;
- Focusing on student growth and achievement, utilizing information systems including data-driven decision making;
- Investing in data mining software and student information systems; and
- Providing continuous support and expansion of all aspects of the technology infrastructure.

From Planning to Implementation

Middletown's Pre-K-12 Technology Plan is an accurate and comprehensive picture of the strategies we are using. One critical aspect is the way the district builds the staff's capacity to learn

how to use technology and to *support* them in the implementation. The district provides and requires professional development to support the integration of technology for every teacher, in every school, in every content area, and at every level. Teachers are expected to complete the required professional development in order to obtain technology equipment. Beginning in 2005, those early adopters who had previously caught the technology "bug" flocked to the first round of programs. Others became engaged by seeing the excitement of their fellow teachers. Every person in Middletown CSD is *expected* to integrate technology. Technology is not just for "techies" or those who are interested. All really means All!

To support staff in learning about technology, the district created three technology coach positions as a key element in building staff capacity. The technology coaches:

- Provide direct skill instruction to staff in professional development classes offered after school;
- Guarantee a safety net for teachers as they use technology in the classroom;
- Provide onsite, ongoing technical support, which is especially critical for those who are reluctant or apprehensive about using technology; and

- Are centrally located so they are available to provide support districtwide.

Applicants for teaching positions are screened for their interest and ability to use technology in instruction, and every new hire is expected to participate in the district technology introductory professional development course.

Technology Integration in Action

Our Technology Plan and its level of support have really paid off. The following sample scenarios describe the ways that teachers with all levels of technology experience and interest are building their expertise with technology integration.

First-Graders Love the SMART Table

Veteran first-grade teachers Monica Alderman and Lucia Weier freely volunteered that they had minimal experience with technology in their classrooms. When approached by technology coach Jesyca Greene to share a SMART table for a pilot program for language instruction, they began by learning how to use the applications provided by SMART — and incorporating the SMART Table as a center for guided reading activities during daily literacy instruction. A

SMART Table is an interactive learning center, which is multitouch and allows groups of students to work on one surface simultaneously. Monica also experimented with developing math activities on the SMART table. By the time the table moved to Lucia's room, both teachers had learned how to use the SMART Notebook software to develop some of their own SMART Table lessons.

During the course of the pilot program, students were engaged in assessing the success of the technology through class meetings and responding to writing prompts. One seven-year-old student said, "I like it because we have to think about and talk about what we see." Common themes from the students were that they needed to talk with each other about their ideas and work together to choose answers, and that use of this technology reinforced reading because they had to read directions, questions, and answers. Through observation, the teachers were able to witness the collaboration and an increased level of conversation and thinking skills.

Television Producers in Grade 4

David Craig, an experienced grade 4 teacher, is a self-professed "techie." He found a newscast activity in a book on literacy he had borrowed from the Middletown Teachers Center library. He divided the class into reporting

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teams and taught the students how to use the cameras and computer hook-ups for projection. This allowed the class to view segments of the production directly from the SMART Board.

The students' enthusiasm was off the charts. They interviewed staff and administrators and combined the footage to create the class newscast: "Room 011 News." With the help of the district technology department, the final version was shown on local television (Channel 20) in Middletown.

David reports that technology has had a tremendous impact on student learning in his classroom. The newscast experience helped transform the shyer fourth-graders into excited junior reporters and avid learners. Many of them wanted to be on camera and helped to create questions to ask during interviews. The more timid students took pride in running the Flip camera. Getting children to talk in front of their peers is not always easy, but this project helped some of them overcome that fear. David created other technology-based projects, including:

- A blog to motivate students to read more. They would write about what they read, both in school and at home. David didn't have the heart to close the blog because even over the summer his students were still writing about what they were reading.

- A Web page full of interactive resources for students to use both in school and at home. Former students continue to use these online resources.
- Activities drawn from *NYLearns.org* — which provides access to educational resources and instructional content developed by master teachers. The content is aligned to the New York State Learning Standards.

3-D Technology in Biology

High school biology teachers Lauren Claisse and Martha Brunelle, with intermediate skill levels in technology, had little experience with the scope of 3-D software. The software presents objects studied in biology projected from a computer, showing parts of organisms — such as taking a tour of the body. The software allows students to manipulate objects, see their relative locations, and label parts. Lauren and Martha learned how to use the new technology with strong onsite support from technology coach Amy Creden.

When asked to pilot the 3-D instructional technology, the two team teachers decided to explore whether students would actually improve academically using this new technology. They decided to approach the implementation as scientists and selected

two-year Inclusion Biology Core classes to study. The students in these classes were either designated as having learning disabilities or students who could benefit from having the information presented at a slower pace — over two years. The demographics of the two groups were similar. Each class had approximately 50% of the population designated students receiving special education (those with IEPs). The other 50% was composed of students requiring extended learning time or who were Limited English Proficient.

One group was given a pre-test on photosynthesis and then exposed to a standard review lesson using a 2-D leaf model and worksheets. They were then given a post-test. They scored an average of 53% before the review, and 63% after the worksheet review. The other group was given the pre-test and scored an average of 33%. They were involved in the lesson using a 3-D simulation on photosynthesis and completed the same worksheets. At the end of the lesson, they were given the post-test and scored 76%. While there are many variables that can influence outcomes on a test, this result was exciting!

Technology Crosses all Disciplines

Heather Illingworth teaches a high school Advanced Computer Graphics

course, which focuses on design software such as Photoshop, Illustrator, and Dreamweaver. In the summer of 2010 she was selected to attend a prestigious two-week training program, Teaching In Contemporary Art (TICA), at the School of the Art Institute of Chicago. As a district leader in implementing technology, she reported: “TICA proved to me that art and technology are crossing into disciplines such as science, math, ethics and communication more than ever before.”

The TICA summer program exposed Heather to several prominent artists who use technology in their work, including: Richard Pell, a professor at Carnegie Mellon, who founded the “Institute for Applied Autonomy” that focuses on robotics; Eduardo Kac, who manipulates genetics to create new “designer” animals like “Alba,” the genetically altered green fluorescent rabbit; and interdisciplinary artist Heidi Kumao, who creates video/projection installations to explore social phenomena and historical events that temporarily place the viewer outside his or her comfort zone. Heather also was introduced to several software programs, many of which are free, such as Processing and Pure Data, which use algorithms, math, and coding to create art.

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TICA influenced how Heather teaches in terms of exposing students to new software, and inspired her to ask her students to question their environment and to collaborate with each other. She says that art is not one person standing in front of a canvas, but rather — similar to other aspects of our lives — art now focuses on people pooling their special areas of expertise to create something new. The common message for art teachers and all teachers is to *combine and synthesize and work together*.

What is Next in Middletown?

Some of the most recent developments for Middletown include:

- Exploring “push out’ technology to engage parents/caregivers and community members. Recently, the school district launched a revamped website, and for the first time, instant updates on school news, emergencies, events and sports are available for the iPhone, Blackberry and Android. The aim is to open new and more convenient ways of communicating district information to parents through the use of new technologies.
- The planning stages of a new elementary school feature state-of-the-art technology devices, including learning walls, individual micro projectors, and iPods.

- *Enhancing Education Through Technology — Student-Centered Active Learning Environment (EETT3-SCALE)*. This federally funded grant, awarded by the New York State Education Department, involves teams of teachers from Maple Hill Elementary School and Middletown High School:

Six teachers selected at Maple Hill Elementary (grades 2-5, including special education) will each be given an iPad, an iPod Touch mobile learning cart equipped with 30 iPods, and one MacBook for use in the classroom.

At Middletown High School, 10 ninth-grade math teachers will each be given use of an Integrated SMART Board, Airliner, laptop, TI Navigator and a set of TI-84 calculators.

Sixty percent of the grant funds must be spent on high-quality professional development focused on technology integration. Intensive professional development will occur throughout the school year and will focus on:

- Integrating the use of technology into the curriculum, and
- The use of technology as an instructional strategy to meet the differing needs of the students.

The critics say there are too many obstacles to district-wide technology integration — only rich districts can integrate technology, teachers are too resistant to change and too afraid of failure. Money, resistance and fear can be obstacles to implementing any change effort. What does it take to overcome the obstacles? Middletown (administrators, teachers, and other staff) believes the key is:

- a solid vision
- a long-range plan
- effective utilization of resources

As union president, I would add the following to the list of critical ingredients: honesty and trust between the administration and the teachers, and a willingness to do the hard work together. Middletown teachers and administrators say they cannot imagine education without cutting-edge technology. The results can be seen in the students, who are proud of their district. Middletown students now demonstrate a newfound confidence that they will succeed in the world of the present and the future.

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Resources that Middletown Drew Upon in Developing the Technology Plan:

21st Century Skills

<http://www.21stcenturyskills.org>

P21 Framework

http://www.21stcenturyskills.org/documents/P21_Framework_Definitions.pdf

International Society for Technology in Education (ISTE)

http://cnets.iste.org/students/s_stands.html

Science, Technology, Engineering, and Mathematics (STEM) Coalition

<http://www.stemedcoalition.org>

New York State Education Department. USNY Statewide Learning Technology Plan

<http://www.p12.nysed.gov/edtech/>