

Innovative Professional Development Helps Teachers Use Technology to Tackle CCSS

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Introduction

Teachers repeatedly cite the lack of hands-on professional development as their biggest obstacle to integrating technology into students' learning.¹ With 45 states and the District of Columbia having adopted the new Common Core State Standards (CCSS) for English and mathematics, teachers nationally have a greater need of professional development that provides new methods of engaging learners. This paper showcases three schools taking innovative approaches to professional development, including novel uses of classroom technology, to help teachers succeed at meeting these more challenging learning standards.

Spearheaded by the National Governors Association, the CCSS are an attempt to align English and math curricula nationally to cultivate stronger reasoning skills and reduce students' reliance on rote memorization. New science standards also are in development. The CCSS goal is to ensure all students the opportunity to graduate with a shared set of knowledge so they are better prepared for a post-secondary education and an occupation.

Effective Professional Development Is Hands-On Learning

To achieve these different academic standards, students must learn in new ways, which means teachers must teach in new ways. Long before CCSS was rolled out for national consumption, teachers struggled to access top-notch professional development. Educators already know what works best for improving teaching skills. Research shows that professional development is most effective when teachers have ongoing, job-embedded opportunities to encounter, practice, and master new instructional techniques.² They also need to learn collaboratively from their colleagues.

Education researchers and teachers are painfully aware of training approaches that don't help them improve their teaching: passive lectures or workshops with little or no hands-on practice or follow-up. In addition, handing teachers technology, without lessons on how to use it and ways the tools can best improve learning, has proven ineffective. For example, a 2013 national survey of more than 900 K-12 teachers and administrators, conducted by Common Sense Media, found that while 96% of respondents believe technology has a positive effect on student engagement, 43% of teachers surveyed believe that a lack of training for teachers on how to use and implement technology is one of the biggest challenges to integrating edtech in schools.³

However, some schools and school districts, as the following three case studies show, are innovating to improve teachers' professional development, including teaching educators new ways to seamlessly integrate technology into students' learning the new, national standards. In Quakertown, Pa., and Farmington, Conn., teacher-led training and team-based efforts are solving instructional problems. In Pender County, N.C., teachers are creating technology-rich, teacher-to-teacher learning and are supported by school district leaders. At these three schools, teachers do not "sit and get" information. Instead, with a goal of CCSS success for their students, these teachers are solving problems of practice, learning in context, and finding peers to guide them.



New Common Core State Standards (CCSS) for English and mathematics require **a shift in student learning** from memorization to critical thinking and problem solving.

Quakertown School District

Upper Bucks County, Pa., 15 miles from Allentown
5,500 students in grades K-12

On Jan. 21, 2013, Quakertown School District conducted a “curriculum day” — one of the days it reserves for teacher professional development. In many districts across the United States, these days involve four hours of mandated, uniform training in large-group sessions and two hours of “self-directed” time for teachers to finalize grades or change classroom bulletin boards. While most school districts require teachers to spend a specific number of hours on professional development, they have virtually no way to measure which, if any, new teaching skills teachers learned or whether instruction improved.

The scene now is very different in the Quakertown School District, where teachers recently chose from nearly 70 workshops based on their interests and needs for professional growth. Other teachers led most sessions. About 20 workshops were geared toward CCSS, a hot topic during its first year in Pennsylvania. Another 10 workshops were focused on technology to improve learning, and about half of those linked technology use with support of CCSS. In one such workshop, middle school teachers reviewed and revised their current cyber-curricula — courses available online — and technology practices to address the CCSS. Their cyber-curricula are designed for students who wish to replace or supplement their in-school coursework. The courses, designed by Quakertown teachers using Internet resources, might, for example, be about advanced physics or Mandarin Chinese.

Other workshops explored new or updated online curricula so teachers could familiarize themselves with the technology and strategize with colleagues about the best ways to use it to improve learning.

“Sit and Get” Replaced by Teacher-Led Training

While the push for Common Core learning accelerates, Quakertown continues to explore new and useful technology for CCSS and broader purposes. For example, its science teachers learned to use “augmented reality,” a realistic view of the physical world, to engage students in experiments involving mercury, a metallic chemical substance too poisonous for students to use in a school laboratory.

Quakertown professional development today is very different than it was a few years ago when only “sit and get” training was mandated. Now, its professional development is directed and led by teachers, a move that required an unusual degree of humility and responsiveness from its school district leaders.

According to Tom Murray, the district’s instructional technology leader, when the district surveyed teachers anonymously, “fewer than 20 percent of our teachers said that professional development was effective. You have to reflect on that as a district.” And they did.

About the same time, a related issue surfaced during negotiations with the Quakertown Community Educational Association, the local teachers’ union. The district had one of the area’s longest school calendars, with many days reserved for teacher training.

Shifting Evaluation from Hours to Outcomes

“We still didn’t feel like we had time to get everything done,” said Union President Christopher Roth, then a middle school math teacher. To address the problem of ineffective yet time-consuming professional development, “the conversation shifted from time to outcomes,” Roth said.

What happened? The Quakertown School District stopped counting the number of hours teachers sat in workshops and had teachers and principals collaboratively develop professional development goals. They tied professional development to continuing improvements in their and students’ performance. Now, Quakertown teachers have an incentive to make professional learning count.

Roth has a new job of creating professional development for all the district’s teachers by learning what teachers need and want as learners and finding the resources to meet their needs. He does this by periodically surveying teachers about which topics they want to learn about and which ones they know well enough to teach other educators. Research shows teachers learn best through ongoing, job-embedded training. One of the best and least expensive ways to make that happen is to have teachers teach each other.

Teacher voice and technology exploration also played an important role in selecting a new CCSS-aligned curriculum. Quakertown middle school math teachers faced several issues, including adopting a one-student-to-one-mobile-computer model while searching for a curriculum that best helps students achieve CCSS’ rigorous math standards. District leaders listened when teachers said the district’s first choice for a math curriculum wasn’t challenging enough.



Teacher training is moving from ineffective, ‘sit and get’ passive lectures to **teacher-led, hands-on sessions** to improve student instruction.

“I’m proud of our middle school teachers for saying ‘This won’t cut it,’” said Rachel Holler, the district’s program director for math, science, social studies, practical arts, and English as a second language. This year, teachers are providing input about the new math curriculum that will be launched in September and experimenting with a variety of online resources, including *Reflex Math* and digital curricula from publishers, such as McGraw-Hill’s ALEKS, an adaptive-learning system.

The input from teachers who have hands-on experience with digital curricula should ensure the new resources meet their students’ real learning needs.

“With technology, we always want to make sure we don’t use something just because it’s new, it’s cool, it’s bright and shiny,” Murray said. “It’s never about the technology. It’s about the learning.”



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Tom Murray, Quakertown School District’s instructional technology leader

Farmington High School

Farmington, Conn., a suburb of Hartford
1,300 students in grades 9-12

Farmington Public Schools, a high-achieving district in an affluent suburb of Hartford, Conn., didn't appear to have a problem. Its high school students were acing college admissions tests. But when asked to explain the thinking that resulted in their high scores, students drew a blank. In a recent article published by *The School Administrator*, Kim Wynne, Farmington's assistant superintendent, described their students as "high-achieving, passive learners."

To help their students shift from recalling facts to using facts to think more critically as the CCSS requires, Farmington district leaders in 2010 convened a meeting of school board members, principals, teachers, parents, and students to develop a vision of what Farmington high school graduates should know and be able to do. Their vision of the graduate relied heavily on the framework created by the Partnership for 21st Century Skills, a national group of educators and business leaders working to ensure all students are prepared for the demands of a globally competitive workforce. In Farmington, high school graduates are expected to not only master content, but also to demonstrate key skills such as critical thinking and reasoning, communication, collaboration, problem-solving, innovation, self-direction, and resourcefulness.

Connecticut's
Farmington High School
students were 'high
achieving, passive learners'
until **professional
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on new techniques.**

Instructional Rounds Improve Teaching and Learning

Bringing this vision to life is in the hands of teachers, who are guided by the district's framework for teaching and learning. For example, last year, third-grade teacher Ashley Cote of East Farms Elementary School in Farmington had a problem. During math instruction, her students gave up when solving math word problems. Other teachers experienced the same problem with their students. Perseverance in problem-solving is an important component of the district's standards and CCSS mathematics. Fortunately, East Farms Elementary School and other Farmington public schools have a ready avenue for teachers to investigate and solve learning problems. Farmington uses instructional "rounds" and a related strategy, collaborative inquiry, to give teachers tools to improve their teaching and their students' learning.

In medicine, doctors use clinical rounds, the practice of a care team observing a patient together, to make decisions about the next treatment steps and to improve their practice. Similarly, Farmington is pioneering instructional rounds, where together, teachers observe students in action and determine the next steps to improve their learning.

To increase their students' perseverance in solving math word problems, Cote and her colleagues collaboratively planned a lesson on the topic. Then, one teacher taught the topic while the rest of the team observed. Afterwards, the educator team reflected about which techniques worked well and ways to improve the lesson. Another teacher then taught the revised lesson to a new group of students while colleagues watched. The experience encouraged Cote to change her instruction to allow students to solve problems in groups.

"Students are working more collaboratively and communicating their thinking," she said during a podcast produced by the 21st Century Partnership. "They figure out many ways you can solve a word problem."

Because of Farmington's vision and framework, "We see more responsibility being turned over to students to do the thinking work," said Ted Donahue, principal of IAR Middle School, a podcast participant. "We expect our teachers to pull back. Their role is to be the coach. Their work comes in planning lessons carefully and strategically. We see that more often."

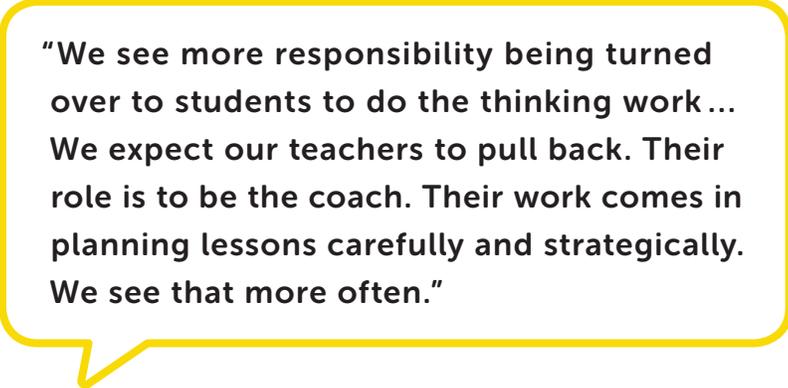
Technology Spurs Greater Student Achievement

Teachers also are beginning to tap technology's power to transform learning. In 2015, Connecticut expects to roll out a new CCSS-aligned assessment, and students will be required to use computers more often. In response, Farmington is scaling up its use of Google's Chromebooks and Apps for Education, said Matthew Ross, the district's technology director. For now, he added, "Teachers can come at it as they will, with a plan to ramp things up this coming fall." Already, however, having easy access to mobile computers offers teachers "that just-in-time tool for extending a learning opportunity within the classroom," he said.

With Farmington's teachers placing learning in students' hands and collaborating to solve their instructional problems, they are eager to add technology to the mix. During the 2012-13 academic year, more than half of Farmington High School's teachers experienced "blended learning" and "flipped" or inverted classrooms, where students learn online lessons their teachers have recorded as part of their own learning about next-generation assessments. In addition, last summer, about one-third of its teaching staff voluntarily attended two days of training about the new Chromebooks, led by the school's technology integration specialist, Andy Marshall. Farmington students are responding positively to the changes. The number of seniors choosing to tackle a self-directed, technology-infused Capstone Project rose from 80 in 2013 to 133 in 2014, which was about 40% of the graduating class. The class of 2015 will be able to undertake Capstone Projects about software design, art and design, and documentary film production.



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Ted Donahue, principal of IAR Middle School

West Pender Middle School

Burgaw, N.C., 25 miles from Wilmington

232 students in grades 6-8

Award-winning teacher Lucas Gillispie is a stealth revolutionary. Leading by example, he helps the growing number of Pender County teachers who want to add video games to assist their instruction.

“Lucas was the catalyst for an academic revolution in my school as well as in other parts of the county,” said his colleague Sara Toothman, an arts teacher at West Pender Middle School and the 2013-14 Teacher of the Year in Pender County, N.C.

In 2009, Gillispie, the county’s instructional technology coordinator, started a *World of Warcraft* after-school club at Cape Fear Middle School and worked to “sneak academic stuff in without smelling like school.” His effort was so successful that his then-principal, Edith Skipper, wanted more. Avid gamers Gillispie and Craig Lawson, a language arts teacher, created an elective course that aligns with CCSS eighth-grade language arts standards.



Teacher professional development **transformed into peer-to-peer coaching** including using gaming and other technology.

CCSS Supports Learning with Technology

“The Common Core State Standards support digital learning well, so making the connections between our lessons and the standards was pretty straightforward. It’s pretty low-pressure for us because it’s an elective without an accompanying standardized test,” said Gillispie, who was named Pender County Teacher of the Year in 2012-13.

Nonetheless, this elective opens a new avenue for students to practice essential literacy skills. “There’s a lot of reading inherent in *World of Warcraft* play,” Gillispie said. He and Lawson coupled playing the popular video game with writing assignments involving multiple rewrites, revision, and editing.

In Pender County, teachers didn’t wait for district leaders to bring them new technology tools and ways of teaching. Instead, they led the way and district leaders followed.

“My supervisor said, ‘I don’t really get this game stuff, but I know you and what you’re trying to do for kids,’” Gillispie said. “We’re a small district. We have a tight team. People are ready to build professional trust and autonomy.”

Those conditions can spark revolutionary teaching and learning. In 2011, Gillispie and Lawson released a full curriculum for the elective with a Creative Commons license, which allows others to use it as they deem appropriate for their schools. Gillispie said about a dozen other schools are now using it, including Long Island’s Suffern Middle School, where students play regularly with Gillispie and his students.

Teachers wanting to learn how to use gaming as part of student instruction can turn to peer communities online for advice. To share ideas, teachers also can participate in the “*World of Warcraft* in School” wiki and listen to Gillispie’s conversations with the county’s teachers, as well as other teachers globally, through conference presentations during the 2013 Gamification Summit. Gillispie’s most successful method of helping novices understand gaming’s value to instruction is face-to-face workshops with teachers. Educators need time to play digital games “with their teacher glasses on,” he said. “It’s really eye-opening when they do.”

During his workshops, teachers play the game and look for vocabulary that is challenging to students. They also discuss digital citizenship and online safety in preparation for conversations with students. After the workshops, teachers can stay connected online.

Toothman, who dabbled using gaming to teach art, credits Gillispie with giving her gaming approach more structure. By using a platform to organize and track her students' quests, she added educational depth to students' gaming. She moved on to experiment and scale up a new game-based course. With Gillispie's help, she won a grant to bring *Minecraft* into West Pender Middle School as an elective. A year later, she incorporated science standards into the elective and taught more than 100 students. Currently, Toothman teaches electives using *Minecraft* and *Guild Wars 2*.



Playing games with their 'teacher glasses on' gave educators a better perspective of how to **improve student instruction and support CCSS.**



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Lucas Gillispie, teacher at West Pender Middle School

Conclusion

Education innovator John Dewey once said, “Give the pupils something to do, not something to learn ... and learning naturally results.” As these three examples show, the same idea applies to effective teacher professional development. Teacher-directed, hands-on teacher learning in collaborative settings leads to better student instruction.⁴As teachers from these three school districts demonstrate, technology also can help teachers engage students in learning even tougher academic standards. Immersive technology, thoughtfully integrated into instruction, can cultivate students’ exploration, critical thinking, and self-directed learning — skills needed for an advanced education and a career.

Technology can shift the teacher from a “sage on the stage” to a “guide on the side,” as children work at their own pace. But educators can only improve their teaching to help students achieve high academic standards when teacher professional development is led by peers and embraces the technology people use at work and at home. When that happens, teachers can transform students’ learning experiences into daily excitement, curiosity, and wonder.



**Active learning
by teachers** sets up
schools to provide student
instruction that supports
the learning skills that
the CCSS strongly
advocates.

Footnotes

1. Common Sense Media (2013). *Teaching with Technology: The Promise and Reality of the U.S. Digital Classroom*. San Francisco, CA: Common Sense Media.
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