Seeing What Our Students Can Do:
One Model

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Traditional strong teaching projects can be updated for today's high level expectations of Standards learning when carefully done. Also, our technology capability can transform those same projects into expanded learning for today's students. The difference is we must modify our work to better mesh with Standards learning.

Common Core State Standards are often criticized by those who don't understand them. Critics bemoan what they see as the "dumbing down" of Standards teaching. Standards learning constrains teaching, some charge. Academics rail against "one-shot 'bubble' tests" to assess student learning.

But I watched in awe a student whom I had asked to report to a committee on a research project he had done with his team for their class project. It was a magnificent project. I then saw that this high level class work addressed well almost all of the Common Core State Standards reading and writing standards, without intentionally doing this. The students learned the Standards through applying them in this project, pushing boundaries to learn new skills. Everything this student reported on sparked our attention.

This is an example of how strong school work can naturally mesh with Standards. Standards needn't inhibit inventive, interesting projects that engage students and excite them about learning. On the contrary, this is exactly what we need to promote high level learning.

Research has yet to show that students learn more with technology use. However, when we take advantage of technology for students to learn the fundamental content area skills and understandings, students make huge leaps forward.

Research *has* shown that one of the learning methods that result in increased achievement is "project-based learning." Remember the old Paper Mache volcano we constructed years ago in elementary school? Or the chemistry class project that we researched and did on our own? The deadly English class research paper? This is project-based learning, often developed poorly. The other key teaching method that works is "differentiating instruction," modifying the activities for different students and students of varied achievement levels. These two methods are the basis of the project our student reported on to our committee. Technology is the key to power student projects and varied learning that suits each student. Not to mention the fact that technology is the tool that our students now have grown up with. A ten-year-old today has the skills to research a topic via the web. We must hone these skills.

When we "flip" teaching and learning to have students become engaged in research to learn the content and skills of the discipline, learning in substantive ways, students are expanding their knowledge, along with stretching digital literacy. This is one way in which we can harness technology for learning. Technology can be the perfect tool to effect project-based learning. When we focus on Standards, we see this in test results.

Our student's report on his project was presented at a committee meeting that I chaired. As the school district Curriculum Director, my Superintendent asked me to pick up an initiative on "21st Century Skills" for our school system. I had attended the *Massachusetts Computer Using Educators* (MassCUE) annual fall conference with our technology integration specialists at the massive Gillette Stadium, enormous home of our New England Patriots football team. The stadium was packed, not with huge gladiators, but with computer using educators eager to hear how we can move to best use of technology.

What especially connected with me at this important conference was when I heard a Harvard doctoral candidate speak beautifully on the need for "21st century skills." 21st century skills is hardly a new concept for schools, but he presented intelligently, graphically, and with a sense of urgency. This articulate young man projected visuals of a person-free airport lobby with only machines to use to get one's plane ticket – we know the machine can now do the simple jobs; those jobs no longer exist for people. We use a credit card and pump our own gas. I thought of the demise of local bookstores, and the big chain bookstores supplanted by the kindle, the nook, on-line e-book purchase. Where are the lower level jobs for our students who are just getting by?

This speaker made the point –- without explicitly stating it-- that our schools are in the dark ages with our delivery of service. We knew that, but what's a better way?

Finally at the end of this technology conference I heard a charismatic young Apple representative speak energetically about "PBL" – project-based learning, and how technology supports this. He resurrected for me from my own earlier teaching experience how project learning brings in student engagement, differentiated learning, and all the teaching methods we know work best, but remain only marginally used in our classrooms still today. He put it all together for me. I got it. Ways to spark student engagement in learning, substantial learning, using technology, preparing students for today's world, Standards learning, and traditional practice all fit like pieces of a puzzle.

My thinking at last moved from vague 21st century skills association to full understanding of what technology for learning is about, more fully integrating technology to help students with the core learnings we want students to learn, and with skills and understandings our students need today for college success, to locate or create a job for oneself, and serve effectively in today's competitive workplace.

With technology, students can learn to work collaboratively for shared intelligence and problem solving, and use digital literacy for learning, not simply the relatively mindless instantaneous connection of social media. We can "flip" learning so that the students can advance learning on their own. Students learn best working from the need to know, not passively sitting while the teacher explains, which research informs us limits learning especially for advanced students.

I discussed with a department head a new teacher who only knew teacher presentation of information from her own private school experience. After our student's report our 21st century skills committee, the department chair said, "I want this teacher to see what our students are capable of doing." He nailed it.

When my superintendent had asked me to lead the "21st century skills" initiative, I formed a committee of parents, students, school committee members, a principal, the high school assistant principal, our middle school – high school technology integration specialist, and our district technology director; the Superintendent attended also. My hope was that we could discuss together how 21st century skills could be introduced. I was stepping into uncharted water, not knowing what I'd find. Taking risks can work. Or not. This worked, in an unexpected way.

Commenting on this mixed committee representing all facets of the school system, our technology director kept saying, "We've never done this before." Bringing people together and cross-pollinating varied school constituents' communication, when well facilitated, helps build understanding. Advancing school learning with representatives of varied groups can take us in a new direction. Collaborating promotes new learning.

The MassCUE conference presenter had advised us to start with a project already existing in the district. This is when technology most easily grows, rather than bringing in a project from outside that's foreign to teachers; that rarely works. So at one of our committee sessions I asked a student to present his National History Day project.

My PC laptop didn't project well onto our school conference room SmartBoard for this presentation. I gingerly handed a borrowed Mac laptop to our student presenter Peter, not familiar with the Mac myself, clueless as to how to hook it up to the Smartboard. Peter easily took off in front of this normally intimidating audience, saying to me reassuringly, "Oh, thanks, I have a Mac laptop." The generation gap is the digital gap.

Easily toggling back and forth between his two web sites he had created for the National History Day competitive project, last year's on the theme of Innovation, and this year's web site reporting his research on the Spanish-American War, Peter focused on the 21st century skills he and his peer teams had used to create these presentations. However, he didn't intend to be quoting almost directly from a book we were using to create common understanding (Trilling and Fadel's *21st Century Skills: Learning for Life in Our Times*, 2009); Peter was simply reporting to us what he did in creating these sites. Peter provided a textbook case of learning that the book argues for.

In this annual history project of a research project on a national theme, students must use a web site template that's provided to present their research findings. Their research thesis statement could be no longer than thirty words. Word count on each

web site link is limited, forcing students to cut to the chase, to be succinct in statements, capture the essence, and not plagiarize text. I marveled at this requirement alone and how it forces careful thought, cutting to the core of the concept studied and findings.

When I had assisted earlier in judging the National History Day school student presentations in an evening session which parents attended, I judged a student whose research was on "The Trail of Tears," on the U.S. government pushing Native Americans westward. The student said he had gone to the Boston Public Library for most of his research. I understood that he meant that he had gone on-line for the research, a vast source of information at his fingertips.

Peter and his team also used primary sources, as did other students. On the theme of Innovation, Peter interviewed musicians as he researched Les Paul's innovation of the guitar. His mother knew some popular musicians. What more could a tenth grader ask for in a school project? In this second project, one student on Peter's team located (on-line, of course) all the professors in the Boston area who had a specialty in their research topic. The team e-mailed each of these professors, seeking information.

Peter quietly reported to us that one professor e-mailed to them that, "He told us that normally he doesn't respond to such outside e-mails, but he said that since we had asked such a good question, he would answer." A high school junior receiving that praise from a college professor has impact. Confidence, pride, and courage to explore come from such a professor's honest appraisal. The need to know, and having an open field to research and locate relevant information had provided the students with sufficient information and context to develop a strong research question to impress an expert in the field. And we say that today students don't use the internet well for learning. Perhaps they can.

Peter's group interviewed this professor via Skype, not having to trudge into Boston. They were using world-wide resources from their homes. The team also e-mailed each other at night, immersed in their study, not always having to have face-to-face meetings since they were all on the same wave length, already on the same page from their in-school meetings.

Other teachers allowed these students to use the time in their classes, such as during a graphic arts class. The art teacher said, "Well, they were doing graphic arts." So they were. Technology can affect school culture when we connect with other teachers' work.

Students sought the right image, the right political cartoon that would convey what they were learning. Technology can be the base for disciplines to work together. The students delighted in finding a visual that reinforced their thinking. Learning became fun. Information was all available to them in targeted research via the internet. Peter and his classmates learned how to integrate sound, music, and video clips. When the web site template was too constraining, Peter figured out how to break through the web site boundaries to add information, using programming skills.

With Peter matter-of-factly presenting these two projects to our committee we all sat stunned. And proud. Our district Technology Director delightedly remarked, "This is how businesses are started today. People do research and create their own web site." Voila! A business is born.

To say we were impressed by how much the students learn in this project is an understatement. The teachers are coaches, asking students to refine their question, guiding them. "We were assertive in going to our teacher with questions," Peter stated. They learned how to learn.

"You'll never forget this project," I told the student who did the "Trail of Tears" research. His enthusiasm was palpable. He continued to talk with me about what he had learned in his research. This young man presented facts that stunned him about the tragic nature of the Native Americans pushed westward, powerless to rebel. He was passionate about information and understandings he had pursued on his own.

These students learned that they could learn on their own; nothing was too hard for them, especially as a group when tasks were distributed; walls were skimmed. The students learned one topic in history well. But they learned how to learn the skills for researching any other topic. In addition, they learned new digital literacy skills that carry them into any new application, vaulting barriers.

Collaborating on a team project means deciding as a group what information to pursue, and determining what information and associated graphics to place on the group's web site. Such collaborative decision-making is hard. It's also real-world. Engineers today can no longer go off on one's own to develop a project, a product. Technology and the world have gotten too complex. The days of the single innovative hero -- a Bill Gates,

Steve Jobs, Mark Zuckerberg -- may be gone. We work together to combine ideas, share information, listen to one another. When students can learn this early in life, we serve them well. Students learn to learn from one another.

The school had been doing this research project for twenty years, now upgraded.

Peter's team didn't win at the state level. Others from the school did, and they went on to the national competition in Washington, DC. All of Peter's team's extensive, inventive work was not recognized to move on to the national competition. Resilience is a 21st century skill. We try and we fail. We learn to turn on a dime, pivot. One company folds; we turn elsewhere. When their sensitive teacher asked the team if they were ready to talk about the competition judging results from outside judges, they told her, "Oh, sure. We overheard our judges earlier saying they didn't like all the extra bells and whistles on the web sites." When will more adults learn to value innovation, technical learning.

I saw Peter later in the spring and congratulated him for winning at the state Science Fair, held at MIT. "I was surprised," he said. Expect the unexpected. Risk and try again. Carry the skills into a new area.

The school gave Peter an award for his History Day project. Peter mentors other students in doing their History Day projects. He's ready for college and the 21st century workplace. Watch out for Peter, the confident young man not looking to "win," but the capable, adaptable, resilient, eager learner; the collaborative and inventive student of today.

Let's serve all students to help them advance on their own, to see what they're capable of doing. Technology can help tremendously.

What about Standards learning? Not intended to address Common Core State Standards, this project teaches sixteen of the twenty Common Core reading and writing Standards. Students learn these Standards well from doing the work on their own. One-third of the Common Core writing Standards are on research, the others are on cogent writing and varied writing for audience and purpose. The reading Standards are close reading of informational text, critical analysis, and how word choice conveys point of view, analysis decisions the research project team had to make together.

With this special updating of the old research paper where students worked alone, writing on their own on note cards, no collaboration, solitary in often dreary libraries, the liveliness of interaction on ideas and pushing one another forward is today's successful workplace. It must become the classroom also.

A final critical observation: From the big picture point of view, there are a few concerns:

If these students had then each, as a final project, been asked to write up their research in a research paper, how easy this would have been for them to do, having explored the topic so well. In hearing the students speak about their projects, they could then have transferred one's own point of view on the topic into the argumentative writing or the expository writing elements that Common Core Standards call for. Each student could have written up the research in the specific format required by Common Core State Standards learning. Reading one another's papers would have informed this lengthy, substantial and substantiated research project. Writing ability on one's research is still needed in college and careers.

Another caveat: High school classes are leveled. This project was an assignment only for the Honors level students. The research project was optional for the College Prep course level, not included for the general level students. In addition, students were advised that if they weren't comfortable with technology they should use a paper tri-partite presentation.

Even if the other class levels or students with less digital literacy confidence and competence had not excelled at the level of the Honors class students, this project – adapted as needed and with technology required -- would have engaged all students and certainly developed their learning. This is differentiated instruction.

We might even be pleasantly surprised at what the other students who were left out of this project could have accomplished.

Science Fair Winners *Peter (back row) is shown with winning school students from the Massachusetts State High School Science and Engineering Fair held at MIT, May 2011, with his team that placed second state-wide. Peter's team's project was "Signal Strength of WiFi as Affected by Various Materials."*

Kay Scheidler photo from Harvard University Gazette article on summer technology institute
http://news.harvard.edu/gazette/2001/08.16/12-techsavvy.html