Test Taking or Project Building? Internet 2.0 in K-12 Education After the Bubble Burst

Michael Charles

Recommended Citation
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Test Taking or Project Building? Internet 2.0 in K-12 Education After the Bubble Burst

Michael Charles
Professor of Education, Pacific University

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Introduction

At the beginning of the 21st Century, a high school teacher in New Jersey named Will Richardson started reading the book Secret Life of Bees ¹ with his junior and senior students (Richardson 2010 p. 23). ² It was a relatively new book, and so he suggested to his students that they use an emerging media tool, a weblog (or blog) to create an online reader’s guide to the book. As part of the experience he asked Sue Monk Kidd, the author of the book, to ask if she would join the students in their study of the book. So as his students read the book and began commenting on it, Sue read along with them and began responding to a series of questions they asked. One of her responses ran 2300 words. In Will’s classroom a blog was not something you heard about in the news, but something you used both to engage your own learning and to reach beyond the proverbial walls of the classroom. Internet 2.0, the read/write web (often referred to as Web 2.0), was beginning to make the kind of impact in K-12 education that some had imagined.

What happened in K-12 education with the advent of the Web 2.0, after the dotcom bubble burst? After rapid expansion at the end of the 20th Century, the story of the decade, from 2000-2010 involved maturing ways of using the Internet. This article attempts to describe what that maturing use looked like in K-12 education, both in what was hoped for, and what took place. It does so by

¹ Secret Life of Bees (2002) Retrieved from: http://weblogs.hcrhs.k12.nj.us/bees/ (Note: This Link is no longer valid as the site has been taken down, but you can find more by googling “Will Richardson Secret Life of Bees”)
taking a look back at previous work the author has written in *Interface* and following up on its progress through the lens of Web 2.0 tools.

On the whole, it appears that despite the availability of increasingly easier to use Web 2.0 tools such as wikis, blogs, and podcasts, the past ten years has seen a marked decline in the kind of project-based learning with technology in K-12 schools that is exemplified by Will Richardson’s students’ work as described above. Instead, the Internet is being used increasingly, to more efficiently measure student achievement on a school wide basis, which is part of a production mindset that is pervasive in the culture as a whole and enjoys increasing influence in education in particular. This movement has been counterpointed by the limited use of Web 2.0 tools to reach the worldwide audience promised by the Web and encountered by Will Richardson’s students. In addition there has been an increase in the sophistication of the models used to describe exemplary technology use in schools as combining new technology, progressive pedagogy, and knowledge of content for curriculum-based planning by educators. In the end one hopes that the next ten years will see the re-emergence of more project-based work, although the outlook for change in that direction is not particularly promising at present.

**Technology for Testing**

In the past ten years the Internet has moved into mainstream use in K-12 education across the United States. The widespread use of Web 2.0 applications mean that authoring on the web requires a very accessible set of skills for the general population: if a user can write an email and attach a file, that user can author and collaborate on the Web. The combination of easier to use tools and widespread access in the schools has led to maturing uses of the web in K-12 schools. But has maturing use in K-12 schools in the past ten years meant better use?

Earlier in the decade the argument was made in *Interface* about how technological thinking holds the threat of reducing education from a cultural task to a production task. The cell phone that has become the ubiquitous technological object of the 21st Century is a perfect example of the triumph of technical thinking. Imagine comparing a cell phone from 2000 and a cell phone from 2010. Both phones transfer digital information wirelessly from an expanding number of locations around the globe. What is the difference between

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the two, and why is the newer phone perceived to be better? The newer phone does the same task faster, more efficiently, and more cheaply; that is the essential set of values of the technical mindset. Because of that, one can interact with the newer phone differently (a touch screen instead of a microphone and a speaker for voice). Today's cell phones are described in the parlance of the day as simply amazing, but at the most fundamental level, they are quite predictable. They do the same thing cheaper, more efficiently, and faster as their predecessors and thus they are able to provide new capabilities (e.g. streaming video over the Internet). Technical thinking, whose basic ethic is greater efficiency of systems, is invaluable in perfecting production tasks such as the making of a cell phone. But technical thinking has serious flaws when it comes to cultural tasks, whose means and ends are considerably more complex than simple production tasks.  

The first piece of legislation passed by the George W. Bush administration with a bipartisan consensus before the events of September 11, 2001 was the reauthorization of the Elementary and Secondary Education Act (ESEA), frequently referred to as No Child Left Behind (NCLB) 2001. NCLB represented a watershed mark in a century-long movement to think of education as a production task. Standards are established for all students—analogous to a set of product specifications for a production assembly line. Curricula are written for teachers to use to build those products. Standardized examinations function as quality control checks of those products on that production line. NCLB mandates that all products from the line be raised to a certain quality standard—i.e. all students must pass the exam (no child should be left behind). It is difficult to argue against this notion of higher quality, especially when one views education as a production task.  

The first major piece of legislation offered by the Obama administration, related to K-12 education, is funding for the Race to the Top.  


upon measures of productivity. Typically those measures are improved student achievement scores and perhaps including some form of classroom observation in the assessment of the teacher.  

Thus the first ten years of the 21st Century have seen the continued extension of technical thinking on a bipartisan basis into the field of education. The major shift in the use of technology in K-12 schools through the decade has been in the use of technology as part of a comprehensive assessment tool in a production system instead of the anticipated incorporation of Web 2.0 tools for student projects. Internet connected computer labs and classroom sets of laptop computers on carts are consistently used for administering state tests at schools around the country, with results being reported to central data systems served via the Web. This means that those same computer resources are not available for students to use to employ Web 2.0 tools for projects.

**Web 2.0 Projects—What Could Be**

As noted at the beginning of this article, one of the big stories of the past ten years was the emergence of Web 2.0 tools like weblogs or blogs. Will Richardson, sometimes described as “the blog evangelist,” has written in great detail about how Web 2.0 tools can change education, providing the kinds of tools that allow a teacher to shift their role from the proverbial “sage on stage” to a “guide alongside” of students as they learn.

In the soon to be released *Personal Learning Networks*, Will Richardson and Rob Mancabelli take a visit to another teachers’ classroom to see how the web could be used to allow students to reach beyond the classroom and become learners connected to the 21st Century world:

> “Seventh and eighth grade teacher Clarence Fisher has an interesting way of describing his classroom up in Snow Lake, Manitoba. As he tells it, it has “thin walls,” meaning that despite being eight hours north of the nearest metropolitan airport, his students are getting out into the world on a regular basis, using the Web to connect and collaborate with students in far flung places from around the globe. The name of Clarence’s blog, “Remote Access,” sums up nicely the opportunities that his students have in their networked classroom.

> Learning is only as powerful as the network it occurs in,” Clarence says. “No doubt, there is still value in the learning that occurs between teachers and students in classrooms. But the power of that learning is more solid and

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more relevant at the end of the day if the networks and the connections are larger.”

Without question, Clarence imbues the notion of the “connected learner.” Aside from reflecting on his life and his practice on his blog, he uses Twitter to grow his network, uses Delicious to capture and share bookmarks, and makes other tools like Skype and YouTube a regular part of his learning life. In other words, he’s deeply rooted in the learning networks he advocates for his students.

It’s changed everything for me as a learner,” he says. “I teach in a small school of 145 v, so I don’t know what it’s like to have a lot of colleagues. I can’t imagine closing my door and having to generate all of these ideas on my own.”

This is the Web 2.0 that so many imagined. It is a tool for going public with student work, and a way for a teacher to connect with other like-minded educators to develop further as a professional. As we continue into the 21st Century, the number of tools and their availability seems to only be proliferating. These tools are profoundly decentralized, in that Clarence is constructing his own personal program of professional development and using the Internet to do it.

This same Web 2.0 has great promise for students. I have written about Silas, a 4th grade student in a relatively lower SES school in New Zealand and the way that he uses his blog and related multimedia tools to publish his work to the world. Here I summarize some of those same points in reference to the larger trends discussed in this article. Silas’ entry “My waka animation adventure” was one of the first things that he wrote after only two weeks in 4th grade learning about how the Polynesians had migrated from one island to the next in the Pacific aboard giant double sailing canoes called waka. He created a computer-animated drawing that showed what he learned, and that animated drawing was published as an entry on his blog that he narrated:

“While the waka was battling the odds, the numerous stormy and rough waves were crashing over them. The people were frightened and sad as waves crashed over the waka. And the fierce wind howled like a wolf’s cry.”

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The energy in Silas’ writing is palpable, and his work suggests that he might comprehend at a rather personal level at least some of the dangers of this most hazardous journey of the Maori.

Silas kept his blog throughout the school year essentially as a learning journal, similar to what many educators have envisioned blogs would be used effectively in classrooms. He made over 20 blog entries (about two or three posts per month). The topics he posted on ranged from things he was learning in school (like the waka adventure, volcanoes, and using descriptive words) to things he loves to do (like his Michael Jackson moonwalk). Silas’ classroom only has a few computers in it that students successfully share. There is no lab of computers to visit, nor a cart of laptops for every student to use. Internet access in his school is at a slower rate than at many schools in the United States. The educators that lead his school have plans underway to provide greater high-speed access to computers in his school, but it is not for the purpose of administering standard assessments of student achievement, but instead as a tool for more students to go public with their work.

Draw and talk about what you are learning is a simple and fundamentally sound educational strategy, especially for students at the elementary school level. Having students post on their own blogs for a larger world to read and comment on is an idea that many advocate (Richardson, 2010) but a relatively small percentage of students in the US actually do, often because of safety concerns. Yet at Pt England School in New Zealand, the public school where Silas attends, those safety concerns are balanced by the conviction that student voices need to be heard, and that publishing to the web is a critical part of developing students as confident, connected, and actively involved lifelong learners. Silas’ blog and those of his classmates are open to the world so that any one can read and comment on them. Many of the readers are students from the school or family members of the writers, but a quick look at the map on the blog shows that readers come from several continents.

In 2000 the kind of use for these emerging Web 2.0 tools that many in the US envisioned was similar to what has been described above for Clarence as a teacher and for Silas as a student. But particularly in the United States, Internet use has instead been focused on using this technology as part of a comprehensive assessment system whose intent is to measure the productivity

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14 Pt England School
Pt England School site: http://www.ptengland.school.nz/
Pt England School—Silas’ blog: http://pessilasd.blogspot.com/
of students and teachers in K-12 schools. This move from project-based learning with technology to the more efficient use of these tools for measuring student achievement is part of a system-wide focus on raising test scores. What is being lost in this effort? Alfie Kohn suggests that “we should worry because of what schools are sacrificing in order to focus on raising test scores: recess, music and the arts, inquiry-based science, the time to read good books, interdisciplinary projects, class meetings, field trips, discussion of current events – the list goes on and on.\(^\text{15}\) One can add project-based computer learning to this list of things being lost in schools in the USA.

**Putting Together the Total Package**

One of the encouraging trends in Internet use in education in the past ten years is the increasingly sophisticated way in which technology and content have been connected. For many years those who use technology in the schools have made the point that the question is not really about technology, but about learning.\(^\text{16}\) To ask how one might use a particular set of technologies, such as Web 2.0 tools, in the schools is to frame the question incorrectly. It is an example of what has been described as technocentric thinking\(^\text{17}\) when what really needs to be considered are educentric applications of Internet 2.0 tools in education. Richardson’s discussion of the use of wikis, blogs, and podcasts earlier in this article is a good example of this notion. The idea is that the technology is essentially invisible, and the focus is on the learning. The power of Silas’ blog is not that he is writing a blog, but that he is writing for a larger audience, using the Internet.

This idea of how to effectively put together technology, content, and pedagogy has been more succinctly described in the past ten years with the TPACK (Technology, Pedagogy, and Content Knowledge) model. TPACK has been defined as:

>“Technological Pedagogical Content Knowledge (TPACK) attempts to capture some of the essential qualities of knowledge required by teachers for technology integration in their teaching, while addressing the complex, multifaceted and situated nature of teacher knowledge. At the heart of the


TPACK framework, is the complex interplay of three primary forms of knowledge: Content (CK), Pedagogy (PK), and Technology (TK).”  

The key idea is that in order to use technology to create better learning opportunities for students, teachers must know their content, know how to teach (pedagogy), and know the affordances that emerging technologies provide. At the intersection of these three forms of knowledge is the “sweet spot” of effective technology use in schools, or TPACK. In an article written earlier this decade this idea was referred to as putting together the total package. To really use these Web 2.0 tools effectively, a teacher needs to first draw on strong content knowledge and pedagogical knowledge in combination with technological knowledge. In the first 10 years of the 21st Century, what distinguishes the technological tools is that they are generally getting easier to use. But that does not insure better educational outcomes because the difficulty is not how to use the technology. The challenge is to put together the total package.

This TPACK model has been well defined in the educational research community as a construct for taking a more thoughtful look at what has previously been called technology integration. As one source stated:

“Advances in technology combined with widespread user participation clearly create opportunities in education that did not exist previously. We can assist teachers in reflecting, planning, and enacting instructional strategies based on the TPACK intersection.”

The TPACK model may be an important part of allowing technology to realize greater potential in the schools for the paradoxical reason that it broadens the conversation beyond technology, into content, and pedagogy.

Other serious efforts at charting the intersection of technology, pedagogy, and content knowledge are underway in conversations about the importance of quality professional development for teachers. The failure of previous efforts is described as that it is often focused on learning the new technology. The real problem is putting technology, pedagogy, and content together. Curriculum-based educational technology professional development for teachers is an idea

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that has been advanced to help guide future efforts in the schools so that as millions are spent on technology infrastructure, teachers are better able to use these resources as part of a total package to improve learning.  

Thus if the Internet technology in use in the schools today can be freed up from the fiction that it can be used to increase educational productivity and is instead used to unleash student learning, then the TPACK model can help us move beyond the hype that the Internet will revolutionize education and on to more serious discussions of learning. TPACK and better professional development for teachers are important ideas that have developed in the past 10 years of discussions that might lead the way.

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What Might the Future Be?

Over the past 30 years, critiques of secondary education have called for greater rigor in high school courses. The proliferation of Advanced Placement (AP) courses in high schools across the nation has been one response to these calls. AP courses enrolled 3.2 million students in 2010. These courses offer greater rigor as assessed by a standardized examination, which students may opt to take for college credit for a fee. Yet there is no personal higher education involvement in these courses. Recent research suggests that merely taking AP courses is not a valid indicator of eventual college success. The idea behind the AP system is one based on notions of productivity—students enroll in the same courses in high school that they would take in college—has been described as “learning the same stuff sooner.” Defining better high school courses as learning the same stuff sooner is an extension of the kind of productivity thinking described earlier in this article.

There is a different definition of more rigorous high school courses that accompanies much of the “school reform” discussion. There have been many calls for the need to teach 21st Century Thinking Skills for high school students. This might be called “learning different stuff deeper.” To that end there is a

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28 21st Century Skills


course being offered at a significant number of high schools in Virginia called the Geospatial Semester (GSS). In this semester or year-long course, high school students learn about geospatial technologies such as Geographic Information Systems (GIS), Global Positioning Systems (GPS), and Remote Sensing. They then apply this new technical knowledge to a local community based problem as the capstone project for the course. They may earn dual credit from a Virginia university in a course that is taught by a local high school teacher who is capable in the use of these tools. Higher education faculty who visit classrooms regularly as well as offering email support provide project mentoring and technical support for the course.

GSS has been underway for the past 5 years and nearly 1000 students have completed the course. In the 2009-2010 academic year the course was offered in 15 different high schools and in a total of 20 different classes in 10 different school districts. Thus while this is not a nationwide innovation, it is at least being carried out on a scale of multiple school districts that holds promise for broader implementation. Typical projects include an assessment of the risk of fire for properties adjacent to the Shenandoah National Park. The student devised a rubric that integrated a number of factors, including proximity to forest, type of forest and amount of open terrain to develop a rating system and then displayed the differential risk on a series of maps of the properties. Another project done by a pair of students was an assessment of the traffic pattern of a Northern Virginia high school. The students took data for traffic, pedestrian, and parking patterns at a variety of times before and after school, analyzed the data and developed a set of solutions and supporting maps to try to alleviate congestion.

These are the kind of projects that the Internet can help make possible in our schools, both as a source for data for projects and for project publication. The curriculum-based professional development necessary to allow teacher to teach the GSS course relies on high quality professional development experiences for teachers. To support their work with their students, teachers need online resources and communication tools—all part of a 21st Century workplace envisioned by many authors in Interface and other publications. The possibility of building and sustaining meaningful communities of professional practice using the Internet to support the teaching of courses like Geospatial Semester is most promising. Project-based work might emerge triumphant in the next ten years as the Internet continues to develop. But as long as productivity thinking

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29 Geospatial semester website http://www.isat.jmu.edu/geospatialsemester/.
continues to emerge and dominate the educational landscape, the Internet will be used as a more efficient tool for measuring a very confined definition of student learning called student achievement scores. The question is should the Web be used for test taking or project building?