Technology in Education – Some Big Ideas…

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Hurdles we face in our current education system…

*"To be a successful, you **always** focus on the student. What are their needs? What are their interests? What are they passionate about? Start with that, and then plan to deeply engage them in meaningful, relevant activities. If your focus drifts off target to assessment, technology, content - anything else - you'll lose them."*

My first day as an elementary school teacher is vivid in my memory. I was standing outside the door of my portable classroom trailer. The school that hired me was in its first full year of operation, and already bursting at the seams. I watched the children, and listened to their chattering laughter as they filed into the school. A loud commotion in the distance caught my attention. I saw a set of parents literally dragging their son to school. He had his boots dug into the desert sand, and was crying, "You can't make me go! You can't make me go!" He was forcefully led to my classroom, not too gently seated at a desk, and commanded to stay. The parents then left. I looked at him. He glared at me, and began chewing and swallowing his pencil. With utter disgust in his voice, he said, "I hate you, Teacher."

That was a rude awakening for the first working day of my chosen profession. That morning, as I faced my thirty-six fifth and sixth grade students, I was thinking, "How in the world do I personally connect with each of them? How can I reach out and help each of these wonderful kids, despite their differing ages, skills, interests, backgrounds, and passions? Will I ever be able to make a positive difference for every one of them?"

Fortunately, with the help of some great mentors, including a special education teacher who helped me turn this particular young boy around, I had a successful first year. Many times, the task seemed overwhelming. I faced so many long nights and early mornings that year. Indeed, being a successful teacher is one of the hardest jobs I know.

Why is it hard to be a good teacher? I didn't have time to give it much thought then. I was just thankful to have been hired as a new teacher, and committed to do my best. Now that I've been in education for 33 years, I have learned much through experience and my studies.

So, why is it hard? There are frustrations every public teacher experiences, at least at a gut level – hurdles built into our system of education: First of all, we disconnect children from the real world by pulling them into an artificial environment – school – and grouping them by age. They come in large groups (my classes ranged between 26 – 42 students). Every class I encountered ranged widely in their skills, interests, and motivation to learn. Teachers are required to teach "subjects" which break real-world knowledge and experience into silos - small, disconnected chunks content we often call core standards and objectives. These chunks lose nearly all context with the real world.

Despite all those hurdles there are many wonderful, successful teachers who rise above all that to reconnect, inspire, motivate, and help their students learn.

In recent years I've watched another trend that hampers a teacher's ability to creatively work around classroom hurdles. It is the intense focus on high-stakes testing and assessment. Assessment is an important part of the educational process. But when the **focus** on testing forces a teacher to march through scripted content at the expense of student engagement, we have a recipe for disaster. When salaries are tied to assessment, teachers feel as though their hands are tied. They must succeed (or else)! The option to be creative, or to try a new teaching strategy with even a remote possibility of failing, seems to dissolve in the pressure cooker of high stakes testing. To be successful you always focus on the student. What are their needs? What are their interests? What are they passionate about? Start with that, and then plan to deeply engage them in meaningful, relevant activities. If your focus drifts off target to assessment, technology, content - anything else - you'll lose them.

Connie Yowell, Director of Education at the MacArthur Foundation, eloquently described the problems teachers face in a video entitled "Engaged." You can find this video and several other very good, thought-provoking videos at http://connectedlearning.tv/what-is-connected-learning

In the video she says,

"We really think that part of what's wrong with the current educational system, and why people talk about it as 'broken' is that it's fundamentally starting with the wrong question. The educational system often now starts with the question of outcomes. It starts with, "What do we want kids to learn? What are the goals and what's the content? What's the material they need to cover?"

Then everything [we do] is defined by that. It doesn't almost matter who the kid is so long as we're going on pace through the material and the content, and reaching those educational standards, and those outcomes – because that's our starting point.

"Content is just the context for participating. It's the context for solving broader problems. It's the context for being engaged with peers. And that's – and this is an academic word – but that's one of the big paradigm shifts that we have to make in education today, is to not think about that content as an outcome of learning, but as the context of learning, and instead, think much more about, "Well, what do we want kids participating in, that that content is at the core of it?" And that's a much harder thing to design and to think about."

Connie Yowell

Our core question is, "What's the experience we want kids to have?" So, the core question is around engagement. And as soon as you start with, "Is the kid engaged? What is the learning experience we want the kid to have," you have to pay attention to the kid. In the design world, you have to start with the user. You have to start with the experience of the young person - of the learner. So instead of starting with the outcomes, which is, for most educational systems, a math problem, or a math fact, or a literacy fact – which is not particularly [useful]… it's decontextualized – it has no relevance to the learner, we instead start with, "What is the experience? Really, what do we want them discovering?"

In our traditional school system, where we're driving home facts and discreet knowledge, we don't make room for curiosity. We don't create the opportunity for kids to take things apart anymore, to look inside, to see how they're made, to put them back together again. You know, we used to do it with our old chemistry sets. We used to just play and see what would happen, and wonder about it. And that engages the imagination, and can trigger the imagination. As we get more and more serious about test scores in our kids' future, we move further and further away from those little opportunities to constantly fail and to iterate. We forget that those are also opportunities to iterate with one's identity, and to play around, and to mess around. It's so important to do that when you're at the middle school age and early and middle adolescence. Even as adults, we've got to have these opportunities to be curious about who we are in the world, and about how the world works, and to fail and not be embarrassed by it, and to come back to those failures and do things over and over again.

We all understand what a page turner is. You can't wait to turn the page to find out what's on the next page, and what's happening. You feel it viscerally. It's not just in your head. You don't just have an intellectual curiosity. You really have a desire, a physical desire, to find out what's happening next. In fact, sometimes you can't go to sleep because you just want to keep reading the book. That's a need to know.

In school, we so decontextualize what they're learning. We take it out of context and just teach them discreet facts. Because we're so focused on these outcomes we've forgotten the learner, and we've forgotten that we actually have a passion for learning.

But how do you create a need to know in a kid? That's an emotional question. That's an intellectual question. That's an identity question. When you start designing learning experiences around that, then getting to the content and getting kids to engage in core questions related to academic core, that's actually the easy part. How do we design an experience where kids have a need to know fractions? What in the world would that look like? If I really wanted to design an experience for a 9 year old – a nine year old boy – a nine year old girl – to want to know what a fraction is? And often, that's one of the reasons in our grant making we've turned to games. So games create an incredible narrative and a wrapper of meaning that you can put discreet skills or compe-

tencies within, that you might want to desperately know how to do a fraction in order to solve a broader complex problem that's wrapped inside a game, [or] the narrative of a game. I can tell you that my son just jumps at stuff like that. But in school, he could care less about knowing what a fraction is. If it's in the middle of game play, where he's really working with a set of peers around solving some complex problem, he'll demand that somebody teach him how to solve a fraction so that he can move on to the next thing.

Content is just the context for participating. It's the context for solving broader problems. It's the context for being engaged with peers. And that's – and this is an academic word – but that's one of the big paradigm shifts that we have to make in education today, is to not think about that content as an outcome of learning, but as the context of learning, and instead, think much more about, "Well, what do we want kids participating in, that that content is at the core of it?" And that's a much harder thing to design and to think about. And so one of the challenges for education is for us to actually step back and say, "We've got content over here. This is one of the things that is so disconnected in our educational world. We put content over here on one hand, and then we think about what kids are doing on the other hand. And they stay disconnected. We have to deeply connect those for kids. Otherwise, the learning has no meaning."

What has educational technology to do with this?

Ironically, almost everything! Our current education system is modeled on a 150 year-old industrial era notion that knowledge is a scarce commodity, that one must go to school to get it. Knowledgeable teachers were another scarce commodity provided by schools. Back then, the education system was designed to produce a workforce for industrial factories.

Technology has changed this dramatically. Now, as long as a person has access to the internet, content knowledge is literally at our fingertips via our "smart" devices. Social networks allow us to interact with potentially billions of mentors and teachers. Employers are demanding a workforce who is creative, collaborative, and who are independent thinkers and problem-solvers – skills that are needed for an information-based, technology-rooted society and workforce. (For example, see http://www.kent.ac.uk/careers/sk/top-ten-skills.htm)

Technology has the potential, if used correctly, to alleviate some of the hurdles mentioned previously. For example, if excellent content is freely available online, students can be taught to access it there, and use class time for the important discussions, interactions, field trips (virtual or otherwise), guest presentations, etc. This would normally not happen in the traditional lecture mode. One increasingly popular teaching model is the "flipped classroom" which promotes this type of interaction. A teacher using this model is more of a facilitator than a teacher in the traditional sense.

A word of caution: the phrase "if used correctly" is critical. Will Richardson, in his book, "Why School?" points out that new technologies can be used in two different ways. One is to continue doing what we do now in classrooms - march our students through disconnected content, rehash paper-based textbooks into "interactive" ebooks (think content again), assess them on that content, and on to the next set of standards and objectives.

The other way is to use technologies to allow engagement, solve real world problems, connect and collaborate, explore, create, develop, help students find their passion in life and become life-long learners.

Mr. Richardson *(pictured at left)* says,

"In this new narrative, learning ceases to focus on consuming information or knowledge that is no longer scarce. Instead, it's about asking questions, working with others to find the answers, doing real work for real audiences, and adding to, not simply taking from, the storehouse of knowledge that the web is becoming. It's about developing the kinds of habits and dispositions that deep, lifelong learners need to succeed in a world rife with information and connections. The emphasis shifts from content mastery to learning mastery. That means students have more ownership over their own learning, using their access to knowledge and teachers to create their own unique paths to the outcomes we, and they, deem important."

(Watch Will Richardson's TedxNYED talk – I think you'll be impressed. http://www.youtube.com/watch?v=Ni75vIE4vdk)

Our education system is a huge entity with such inertia that it will take a mighty push to create a change direction. But an increasing number of voices are calling for change, and advances in technology are making those changes become feasible. It's happening right now.

Let me finish with a few quick points:

Technology is only a tool. You must have a plan before you buy and use the tool to accomplish it. As Connie Yowell said, We must begin by designing the experience we want our students to have (and the way we'll deeply engage the students in that experience). Once there is a plan, we can embed content to be learned, and we can then choose the proper tools to help us achieve the end result. Some of these tools may be technology-based. Too many times, in my role as a technology director, I've been asked, "We just bought [insert technology here]. How can we use those in our classrooms? Will you train us on what we can do with it?" That approach is backwards, and will likely fail. You need to start with a carefully crafted plan, then get the tools you'll use to implement it.

If you choose to purchase a technology-based tool, be sure to build in funding for adequate training. You'll want to make sure help is readily available when things go wrong (since they invariably will). You'll need to plan funding for updating, maintenance, and eventual replacement – technology grows outdated so quickly.

Connecting with our students in meaningful, positive ways – making each of them feel wanted, important, safe, valued, and needed – is to me the real "art" of teaching. I call this aspect of teaching "the human touch." Technology used in education needs to enhance the human touch.

First, let's look at an example of a technology that removes the human touch: business telephone answering machines. If you're like me, by the tenth time you've pressed a key on your phone to step through multiple levels of questions or choices, you feel dehumanized.

There are many examples how technology can enhance the human touch: In the flipped class model, teacher becomes a facilitator. Students learn content online, and class time is used to do "homework." The teacher spends time personally helping the students as they practice. Or, class is used to discuss, debate, connect, visit, etc. Students get more personal time with the teacher than in the traditional lecture mode of teaching. If technology can administer and automatically correct tests, quizzes, and assignments – more of teacher's time can be freed to interact with students. Technology can connect our students to many wonderful mentors who can be anywhere in the world. I have watched classes connect to astronauts in the International Space Station, to National Geographic expeditions in the Antarctic, scientists at Houston Space Center, and more.

Teachers may worry that technology will replace them. I don't think that will ever happen – good teachers are desperately needed. Will Richardson said in his book,

> "In my travels, I ask parents that [why school?] all the time. Not surprisingly, the first answer on their lips is not "I want them to be good test takers." Nor is it "I want them to know a lot of stuff." What I hear instead are things like: "I want them to love learning." "I want them to be able to solve real problems." "I want them to be independent thinkers." Those, and many similar outcomes, are what I want for my kids, too."

I, as a father, agree completely. We need great teachers who will help our children network, inquire, create, share, collaborate, and be all they can be. They are too precious a resource to lose (both teachers and students) – and we're currently losing too many of them.

To conclude, our education system needs to change direction, moving away from the industrial era model of teaching to one where technology allows teachers to provide rich, deeply educational engagement for their students. Schools need to become places where students are excited to go, to participate, to solve real world problems, and interact with peers internationally, to create new ideas, inventions, to discover new knowledge. Teachers and students need the freedom to explore, experiment, to fail and try again without being penalized. Discussions should be initiated in school faculties to brainstorm ways to make this a reality. There *are* exciting success stories. Find them, share them, and be inspired by them.

Some thought-provoking resources:

- Why School?: How Education Must Change When Learning and Information Are Everywhere (Kindle Single): Will Richardson (Author): Amazon.com - http://amzn.to/YkJkTx

- TEDxNYED - Will Richardson - 03/05/2011 - http://youtu.be/Ni75vIE4vdk

- Connected Learning - http://connectedlearning.tv/

- Connected Learning – Engaged:
  http://teacherlinkyetc.blogspot.com/2012/11/thought-provoking-discussion-starting.html

- Connected Learning – Everyone:
  http://teacherlinkyetc.blogspot.com/2012/11/thought-provoking-discussion-starting_5.html

- Connected Learning – Play -
  http://teacherlinkyetc.blogspot.com/2012/11/thought-provoking-discussion-starting_2973.html

- Connected Learning – Creative -
  http://teacherlinkyetc.blogspot.com/2012/11/thought-provoking-discussion-starting_9890.html

- Connected Learning – Mentor -
  http://teacherlinkyetc.blogspot.com/2012/11/thought-provoking-discussion-starting_16.html

- The five connected learning videos above can also be seen at
  http://connectedlearning.tv/what-is-connected-learning

- TED: Chris Anderson: How web video powers global innovation - http://youtu.be/LnQcCgS7aPQ

- TED - Beau Lotto + Amy O'Toole: Science is for everyone, kids included -
  http://www.ted.com/talks/beau_lotto_amy_o_toole_science_is_for_everyone_kids_included.html

- Louie Schwartzberg – Moving Art – GRATITUDE -
  https://www.youtube.com/watch?v=nj2ofrX7jAk

Some wonderful web resources:

- Weebly.com and WIX.com are two sites that allow you to create and publish websites with drag-n-drop ease. http://weebly.com and http://wix.com

- TEDed - TED launches new education site with customized teaching tools - http://ed.ted.com/

- The Utah Coalition for Educational Technology Blog - http://ucetnews.blogspot.com

- TeacherLINK Blog - http://teacherlinkyetc.blogspot.com

- Khan Academy - https://www.khanacademy.org/

- TED - http://www.ted.com

- YouTube Education - http://www.youtube.com/education

- Pinterest Education - http://pinterest.com/all/?category=education

- ScoopIt - http://www.scoop.it/

- Archive.org - http://archive.org/

- Books Should Be Free - http://www.booksshouldbefree.com/

- Librivox - http://librivox.org/

- Project Gutenberg - http://www.gutenberg.org/

- NASA for Educators - http://www.nasa.gov/audience/foreducators/index.html