21ST Century Teaching and Learning

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Today's students have grown up in a fast-paced digital world, and easily tune out of the traditional lecture-based classroom. As technology guru David Warlick put it, "they have powers that would have seemed alien to me growing up."[1] Communicating across the world via computer or cell phone is a snap for them. They can teach adults things despite being half, a quarter, or even a tenth of their age. Look no further than the story of John Penn, a sixth grader at Victory Baptist School in Arkansas. John's mother, Paula, is the school librarian and was suddenly burdened with the school's computer network when the existing IT administrator left. Paula knew her son was more adept for the job than she and allowed him to advise. John purchased the necessary tools and has revamped the network.[2]

So, how is this possible? What can a six year old teach a veteran teacher? Today's students are acquiring 21st century skills, and what surprises teachers most is that they are not the ones teaching them. 21st century learners have taught themselves to network and find solutions. Because of this, they expect to have the same experience at school. This trend has rightfully caused a stir in the education community and has called for reform in how and what we teach.

Letters and Numbers

For the past thirty years, we have been labeling generations with letters (i.e.: Generations X, Y, and Z). The roots of 21st century learners can be traced back to this classification system. Generation X is roughly defined as people born in 1970's and early 1980's. Your stereotypical

"Gen Xer" poisoned his/her mind with video games and the launch of MTV. Speaking in very general terms, it can be said that the tail end of them began using the internet. The internet of the early 1990's has been referred to as Web 1.0, in that it was relatively solitary and static. Generation Y can be defined as people born in the 1980's and early 1990's. This group has been classified as the first widespread users of the internet. They are also now the students sitting in America's high schools. The latest generational tag (Z) has been assigned to those born from the late 1990's to the present. Digital technology to them is almost a birthright and schools must accommodate that. This generation is often referred to as the "Millennials;" a reference to not only their birthdates, but also their connection to technology. They use the internet known as Web 2.0 which is more dynamic and collaborative than its predecessor.[3]

A Millennial is defined by his/her ability to adapt and respond to rapid and multiple stimuli. In a recent article, Susan McLester explained a typical afternoon for her 15 year old daughter. She would be, "in her bedroom, iPod charging on the desk, headphones in ears, cell phone in one hand, paperback in the other, television tuned to a *Gilmore Girls* rerun, and computer with display divided among iTunes, YouTube, a *Pride and Prejudice* DVD, and, of course, MySpace."[4] Even visualizing this confuses the mind of a 20th century learner. How can a person focus on all those things at once? These children realize they are growing up in a technology-driven world and are teaching themselves the skills necessary to compete with peers. 21st century learners are asking for a similar environment at school.

Reinventing the "Three R's"

When we (meaning adults) went to school, the "three r's" were reading, riting, and rithmetic. For reasons other than the horrible spelling, this idea has been replaced with the "three

r's" for the 21st century: rigor, relevance, and real world skills. This is important for a number of reasons. In the United States today, our students spend more time playing video games than reading.[5] It is important from the international perspective because 25% of the highest IQs in China outnumber the entire population of North America. Technology also continues to expand. It is estimated that by 2023, a computer with computation abilities exceeding the human brain will cost $1,000.[6]

Those statistics are startling, but the challenge is not insurmountable. In fact, the solution seems quite elementary. Teach our students in the way they learn, by using the 21st century skills they already possess. In order to do this, students must be considered at the planning, delivery, and assessment stages of instruction. The teacher should not be afraid to ask his/her students their opinions. Consider what they can contribute during the planning of a lesson. Give them a challenge and then guide them on their way to the solution. 21st century teaching involves a balance of the objectives of the teacher with the needs and input of the students. For that reason, learning objectives should be specific but flexible while allowing for customization.[7]

21st Century Skills

21st Century Skills have been defined in many different ways. Key components are 21st century content (i.e.: global awareness, scientific literacy), learning and thinking skills (higher order thinking, planning and managing, collaboration), technology literacy (using technology in the context of learning, E-communication), and leadership skills (creativity, ethics, creating products).[8] While the foundation of these skills is technology, they serve more as guidelines for success. Ethical issues such as cultural awareness and social responsibility are 21st century skills as they are directly tied to E-communication. Productivity is another aspect. 21st century

learners must possess both self direction and an ability to collaborate with individuals, groups, and machines. A heavy emphasis is also placed on outcomes. Today's students will be required to think critically and create high quality products in order to compete in the global marketplace.[9]

To acquire 21st century skills, students must be encouraged to create new ideas, evaluate and analyze the material presented, and apply that knowledge to their previous academic experiences. This is achieved by changing the methods of instruction. If teachers consider their students' skills and facilitate learning, students will reach their greatest potential. This does, however, require a shift in thinking. Instead of delivering content, teachers should engage students in the content, which may also mean delivering instruction at a faster pace. A one size fits all approach must be replaced with giving students options. Face to face interaction must be supplemented with online activities. This idea is a great example of how technology acts as a foundation and not what drives 21st century teaching and learning. Technology may actually hinder instruction until this paradigm shift occurs.[10]

How to succeed?

Technology trainers are a good option to ease the transition to 21st century teaching. Teachers already have full palettes of professional obligations and having someone on staff to guide them will produce better long term results. A technology specialist handles researching current trends in education technology, creating professional development opportunities, and supporting teachers in 21st century efforts.[11]

The paradigm shift sounds very complex on paper. It is, however, one of the few things that are easier in practice. Today's students are willing and able to create new tools. The teacher

must only provide the framework. Here is an example from Southern Columbia High School in Catawissa, PA:

> An English teacher had a class that wanted to collaborate with another class. Through a bit of networking, Southern Columbia's teacher met up with an English teacher at Upper Merion High School in King of Prussia, PA. The two chose a piece of literature (in this case, Joyce Carol Oates' "Where are you going? Where have you been?) for their students to read. They then set up questions on a collaborative website known as a wikispace. Students in both classes read the short story and began discussing it together on the wikispace. The students later had an opportunity to meet each other via web cam.[12]

This project took a moderate amount of planning on the part of both teachers and the technology departments of both schools. Most of the work was done by the students who contributed in class, during study halls, and from home. The discussion was very involved and the students even met a few new friends. These students also took more ownership of their work as they were the ones creating the larger product. The teachers acted as guides and facilitated the acquisition of 21st century skills such as collaboration, creativity, self direction, and E-communication.

Conclusion

Technologist Marc Prensky said, "Technology helps 21st century students learn because they can make it do what they need."[13] These learners are enthralled with social technology that can be used for instructional purposes. If we as teachers can tap into that excitement, our students will authentically learn by being engaged in what they normally do. Our students are

asking for meaningful learning more than ever because they realize which skills will build their capacity to compete in college and the global marketplace.

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