



Technology in Education:

Opportunities and Obstacles

BY ASHER GOLDFINGER
ashergoldfinger@gmail.com

SMART BOARDS, TABLETS, iPads, laptops, desktops, Kindles, and even 3D printers: it would not be possible for me to find a classroom in my school that isn't stocked with technology. We are ahead of the curve compared to the rest of the nation, but my district is in a fairly affluent area. Now that we have laptop carts all over the school and a smartboard in almost every room, the district has been debating whether or not to take the initiative one step further and offer a bring-your-own-device policy. There have been a few roadblocks along the way though, because both educators and parents are afraid that bringing personal devices into the classroom will cause more disruptions than benefits during class. This debate mirrors the current controversy that exists across our nation in both educational and political spheres. Our country is failing at educating our children and politicians have found technology to be a means of better education. But just as in my school district, many people within the educational sphere are too skeptical. The only way for technology to work in a learning environment is with proper implementation and the right balance of traditional and new-age methods.

Implementation in the Classroom

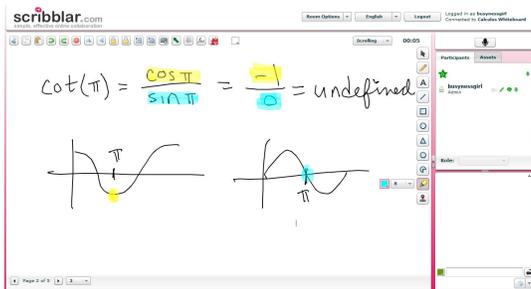
One of the biggest problems with implementation in schools has been the method. In "Classroom of Future, Stagnant Scores," Pulitzer Prize-winning journalist Matt Richtel discusses how technology in education does not necessarily correlate with an improved learning environment and that there are many factors that need to be considered before incorporating technology into curriculums. He details the conundrum in the Kyrene School District of Arizona, which over the last decade has become the district that schools turn to when looking to implement technology. This district spent \$33 million dollars in 2005 getting computer-based learning into their schools and has generated much hope from parents and educators. However, Richtel questions the success of the program and reports that "scores in reading and math have stagnated in Kyrene, even as statewide scores have risen."

The problem Richtel finds is that technology does not offer any benefits if it is not implemented with a purpose in mind. In fact, if the technology is forced, it could be detrimental for students. He quotes a teacher from Kyrene who said, "We have Smart Boards in every classroom but not enough money to buy copy paper, pencils and hand sanitizer." Richtel believes that technology will only be helpful

if it can add an extra dimension to the educational experience that regular methods cannot.

I have personal experience with technology being part of the curriculum and I have to agree with Ritchel. My government teacher recently bought a set of Nexus 7 tablets for the classroom, mainly to save paper but also to bring technology into her classroom. While the purchase was a noble effort to conserve resources and keep up with times, in practice the tablets quickly became inefficient. When we actually use the tablets—which has become a rare occasion—we only use them to look at documents that can easily be accessed on paper. All the devices do is provide means of distraction during class, for we can surf the web and play around with the camera without our teacher really knowing—exactly what critics fear.

The tablets would actually be extremely beneficial if they were better implemented. As Ritchel pointed out, technology is a waste of money unless it gives an advantage over regular learning materials. Some learning environments can better serve students when traditional methods are used. I studied under a physics professor named Burton Budick two years ago and he always preferred a chalkboard to a Smart Board. He thought the bells and whistles of newer technology just get in the way of concepts being taught. This may be true for subjects like math and physics, for which it is much easier to write equations and draw examples by hand on a chalkboard than to type or use other forms of technology, but technology can definitely be useful in other situations.



The whiteboard functionality offered by myfreetutor.org allows students to communicate visually with their tutor.

Over the summer of 2013, I helped develop a site called myfreetutor.org, an application that allows struggling students to connect with anonymous tutors over the Internet. When put into practice, the program’s technology can be extremely helpful. The whiteboard functionality and one-on-one attention the program provides are aspects that simply cannot be mirrored by traditional methods. Such capacities show that when technology provides

opportunities that no other methods can offer, it is extremely beneficial in a classroom environment.

In the same year, the Los Angeles School District put a \$50 million plan into effect to get iPads into the hands of 30,000 students in the district. It mainly did this to get technology into the curriculum for the sake of keeping up with the times, and there was not much of a change in the curriculum based on the iPads. This is an example of bad implementation and it turned out to be a giant waste of money for the district. Without a reason to use these devices, students are going to feel just as bored as they would in a traditional classroom setting. Devin Leonard, an award winning writer who has written for numerous publications, published an article titled “The iPad Goes to School” in Businessweek that centered around this disastrous implementation. Leonard quotes a student from the district who explained “there’s nothing to do on [the iPads] besides academics. They just want it to be a big old book.” Implementation like this prompts the students to try to get around the boundaries set for them so that they are not bored, leading to students getting more distracted than they would otherwise be.

Los Angeles placed strict guidelines on students’ access of the iPads, not allowing them to use websites such as Facebook or Youtube, or utilize any interactive software

that might allow gaming. Although the intention was to block out distractions on the Internet, the firewalls ended up blocking many interactive academic sources. I have first-hand experience with these limitations, as my school limits access as well. Most of the students in my school have mobile phones that can connect to the Internet, and the firewalls that are on the school’s devices encourage students to use their own devices during class. Many of the students of in Los Angeles don’t have access to technology at home, and the Internet behind the firewalls constitutes their entire technological experience. The district criticized the students for hacking past their virtual barriers, but doesn’t getting past the firewall actually do a better job of teaching the students than a regular boring curriculum? Bypassing the security settings teaches creative problem solving and gives students more experience with modern technology that they can use in the real world.

Of course, hacking is not every student’s thing and there is no reason it should be. The only way to discourage it in a school environment where there are firewalls blocking students’ every move is to not have all of the precautions there in the first place. Critics think greater access to the Internet would provide a greater distraction for students. It has in some schools, such as in the McAllen Independent School District of Texas, another district highlighted by Leonard. But if a school is going to give students access to mediums such as social media, then they have to find an educational use for it. Otherwise it will become a hindrance to both students and instructors.

Leonard details a great example of a school that integrated social networking effectively into the curriculum. Burlington High



Examples of tweets from the students in Michael Milton’s class

School, located 20 minutes from Boston offers multiple courses in which students can use Twitter to make pages about famous philosophers and tweet at people as if they were the famous figureheads. Students also blog regularly about literature, news, and other subjects that interest them. All of the students show excitement about using the iPads, even the traditionalists who opt for the old-fashioned paper and pencil. Rachel Czerwinski, a 15 year old student at Burlington, falls into this category. In reference to the Twitter project that her social studies teacher Michael Milton set up, Leonard quotes her saying "sometimes the iPad can be annoying, but without it, we could not do cool projects like this."

The Online Classroom

Online resources outside of educational settings have proven to be extremely helpful to many students. One organization in particular, Khan Academy, has seen great success helping students all over the world with many different subjects. The application they offer includes short video lectures on many various topics, as well as short assessments to make sure students are understanding the material. The added benefit of an online learning application is that students can go back within a lecture until they understand the material and move at their own pace. Salman Amin Khan, the founder of Khan Academy, gave a TED talk in 2011 about the foundation and the future of his application. He created his first video in an effort to help his cousins with their academics, and described some of the benefits that he saw right off the bat.

You have this situation where now they can pause and repeat their cousin, without feeling like they're wasting my time. If they have to review something that they should have learned a couple of weeks ago, or maybe a couple of years ago, they don't have to be embarrassed and ask their cousin. They can just watch those videos. If they're bored, they can go ahead. They can watch it at their own time, at their own pace. And probably the least appreciated aspect of this is the notion that the very first time, the very first time that you're trying to get your brain around a new concept, the very last thing you need is another human being saying, "Do you understand this?" And that's what was happening with the interaction with my cousins before, and now they can just do it in the intimacy of their own room.



Salman Khan, founder of Khan Academy, giving a TED talk in 2011

The benefits Khan describes have helped many more people than just Khan's cousins. His videos have served over 10 million students since their creation. This type of online learning application is also in use for college courses. The Massachusetts Institute of

Technology (MIT) offers an Open Courseware website where you can take a majority of the university's classes online for free, many of which are complete with video lectures and past tests. But the real future in this is MOOCs, or Massive Open Online Courseware. These are courses you can take at your own convenience online and can get full credit for them. Laura Pappano, an experienced writer in the fields of education and social issues, details the many options that the World Wide Web currently offers in the world of MOOCs in her article "The Year of the MOOC." Some of the top organizations include edX—a startup from MIT and Harvard—and Coursera, started by a former Stanford professor.

Although MOOCs offer many of the same advantages that the Khan Academy courses do, there are some flaws in the MOOC system because they are college courses. For one, since students can receive credit for them, cheating can become a real issue that is hard to control. Pappano quotes David Patterson, a software engineering professor at University of California, Berkeley, who states, "We found groups of 20 people in a course submitting identical homework." Some programs like edX are now offering proctored exams, but that still does not solve every problem. With over 10,000 people taking the same course at the same time, it is extremely hard to make the course feel intimate, which is an experience a traditional college would offer. Another problem occurs when students have to turn in work that can not be graded quantitatively.

In a class with a few thousand students and only one professor, it would be impossible to grade each student's individual papers. What many MOOCs are starting to do is let other students grade each other's papers. This spreads the work out so that everybody gets feedback on their writing and the students have more involvement in the course. But there are still many problems with this evaluation process. What if someone is a horrible grader? You cannot expect another student to grade your paper with insane detail. I know this from experience. The papers we turn in for my English Language and Composition class are usually read by other students before we hand them to our teacher. If the final grade we received came directly from our peers, most of us would end up with much higher grades. Students are simply not trained to look over things with incredible scrutiny, and you cannot expect thousands of kids to do that because it is a convenience to the application. Peer review is certainly a helpful tool, but it is not one that should be used as the final grading method.

Overall, MOOCs offer a wonderful online opportunity for people who can not afford college to continue learning or for those just looking to further their education. Nevertheless, there are still many kinks that need to be worked out before they make it big time. Pappano may think that 2014 is "the year of the MOOC," but I think we still have a few more years before online courseware is ready to take the stage.

The Promise of Blended Learning

THE MOOC IS A TYPE OF LEARNING that is completely grounded in technology, and as I already pointed out there can be some caveats with this method. But the benefits that technology brings to learning are too great to be ignored. A balance in the classroom needs to be found and the best way is to use a method known as blended learning. Margaret Ramirez, a writer for The Atlantic and Newsday among other publications, describes the implementation of blended learning in Aspire Titan Academy in her article "When Computers are Co-Teachers." In her introduction, Ramirez talks about the classroom of Mark Montero, a teacher at the

Academy. Montero, who uses computers as co-teachers, can provide more targeted instruction to his students while exposing them to modern technology. "Technology is so important in education, especially in low-income communities that don't have access to it," he said. "If we as teachers can give them that access and make it purposeful for them... that's how they're going to be successful."

Ramirez uses quotes from both teachers and students from the school to gauge a wide perspective and the overall theme seems to be that blended learning offers many of the benefits of technology in the classroom while eliminating many of its detriments. Aspire Titan Academy is a powerful example of a school that uses blended learning because it is located in a part of the country where education is not typically a strong point and money does not exist in large abundance. Ramirez points out that many of the Academy's students have not used a computer before, "so the fact that we're giving individual students the opportunity to use these computers, all by themselves, it empowers them. It makes them feel a sense of greatness because they are able to do something they've never done before."

"You can't just waltz into a school talking about disruptive innovation, because teachers are going to think you are disrupting their classroom."

- Michael Horn

I attended a Philadelphia Social Innovations conference at the beginning of April centered around blended learning. There were representatives on panels from cyber-charter schools like EdPlus, regular charter schools like Mastery Charter, the Philadelphia School District, as well as researchers from Clayton Christensen Institute for Disruptive Innovation and the Public Health Fund. The panels all had lively discussions about the types of implementation in schools, how to make sure that they worked, and the language that was used when implementing. The last topic of argument was one I had not considered previously, but when Michael Horn from the Clayton Christensen Institute was giving his keynote address, he caught my attention when he said, "You can't just waltz into a school talking about disruptive innovation, because teachers are going to think you are disrupting their classroom." This was just one example of language that might scare possible schools from applying technology into their curriculum and his speech made me realize that when trying to sell new prospects on the idea of technology in a learning environment, the message has to sound like it would not change the existing environment too much, or else people will be scared of trying it.

There is no better way of describing technology in the classroom than calling it disruptive innovation. It disrupts past learning methods and replaces them with newer ones. What blending learning does is limit the disruption while still providing the benefits of the technology. This gives technology a better chance of being accepted into classrooms, and teachers who are less willing to give up on the past will be more likely to try it out if it is only semi-obtrusive. There will never be any true measurement of how well technology is working unless it is placed in more classrooms for an extended period of time, so the more teachers who are willing to try it, the more accurate studies on education with technology will be.

ONE OF THE LARGEST CRITICISMS of putting technology into effect in the classroom is that there is not enough evidence to prove that it helps students learn. This is true, and the possible success that technology can provide will not be able to be measured for years to come. The problem is: whatever we are doing now is not working. According to the Organization for Economic Cooperation and Development, American students rank 25th in math, 17th in science and 14th in reading compared to students in 27 industrialized countries. A study done by the Huffington Post in 2013 highlighted the fact that 19 percent of high school graduates in the U.S. are illiterate—and that statistic only includes the 80 percent of high school students graduating across the nation. Something has to change in the way students are being educated. Technology gives us the possibility of a better education while preparing our children for the modern world. We might as well give it a shot in the classroom.

Can we afford not to? Hopefully we will find the right balance and methods to take advantage of the potential that technology offers.

- Crum, Maddie. "The U.S. Illiteracy Rate Hasn't Changed In 10 Years." The Huffington Post. TheHuffingtonPost.com, 06 Sept. 2013. Web. 02 June 2014.
- Leonard, Devin. "The iPad Goes to School." Bloomberg Business Week. 24 Oct. 2013. Bloomberg. 30 Mar. 2014 <www.businessweek.com/articles/2013-10-24/the-ipad-goes-to-school-the-rise-of-educational-tablets>.
- Pappano, Laura. "The Year of the MOOC." The New York Times. 03 Nov. 2012. The New York Times. 30 Mar. 2014 <<http://www.nytimes.com/2012/11/04/education/edlife/massive-open-online-courses-are-multiplying-at-a-rapid-pace.html?pagewanted=all>>.
- Ramirez, Margaret. "When Computers Are Co-Teachers." The Atlantic. 10 Jan. 2014. Atlantic Media Company. 30 Mar. 2014 <<http://www.theatlantic.com/education/archive/2014/01/when-computers-are-co-teachers/282927/>>.
- Richtel, Matt. "In Classroom of Future, Stagnant Scores." The New York Times. 03 Sept. 2011. The New York Times. 30 Mar. 2014 <<http://www.nytimes.com/2011/09/04/technology/technology-in-schools-faces-questions-on-value.html?pagewanted=all>>.
- "Salman Khan: Let's use video to reinvent education." Salman Khan: Let's use video to reinvent education. 30 Mar. 2014 <[#t-9000](http://www.ted.com/salman_khan_let_s_use_video_to_reinvent_education)>.