A Quick History

## Technology in the Classroom

THE **EVOLUTION** OF **TECHNOLOGY** IN **SCHOOLS**

Why Should I Care?

Educational props have always been present in the classroom. From the horn-books of colonial times, to the magic lantern, chalkboard, and the pencil, each integration has brought a new and progressive approach to education. However, while educational technology has the potential to enhance both teaching and learning, these technologies are not always used to their full capacity.

Technology is currently advancing at an unprecedented rate and it is our duty as educators to prepare our students for a society that is becoming increasingly reliant on digital practices. Professor James Kalmbach of Illinois University writes "One of the best ways I have found of coping with this continuous process of technological innovation is to stay in touch with history" (Kalmbach, 1996). History shows us the success that progressive technology has had on students and the obstacles that have been overcome in order to implement new practices.
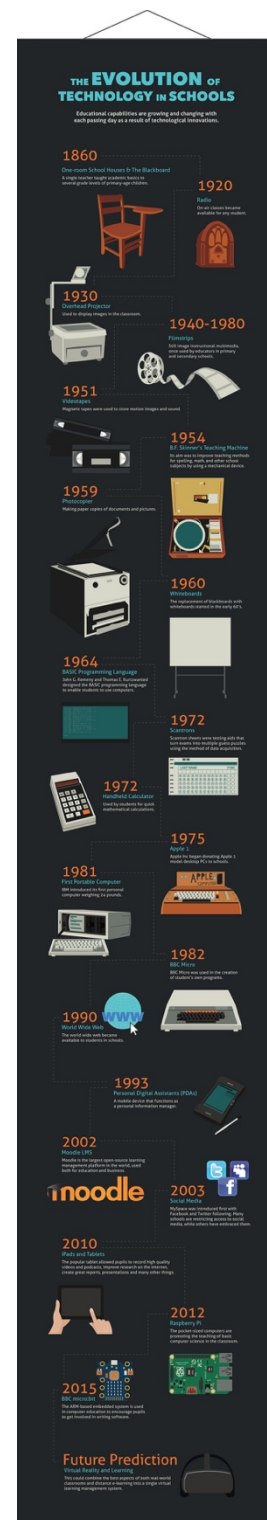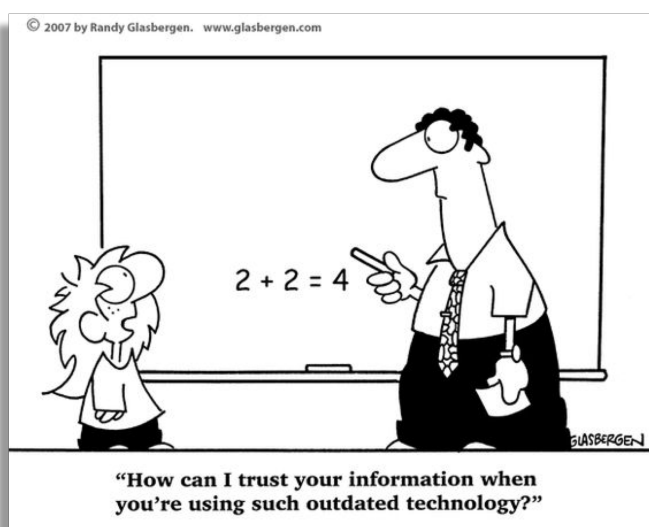
From the Hornbook to the Ballpoint Pen

Have you ever heard of a hornbook? Unless you have encountered one in a museum or seen a picture of one in a text book, most likely this is your first encounter. Hornbooks were popular in the colonial era and were simply wooden paddles with printed lessons on them that children would copy down in order to learn how to write (Wilson & Meek, 2010).

In the 19th century the school slate was introduced to classrooms and was used in nearly all classrooms. The ability for students to work individually on their lessons in a schoolroom and erase mistakes was revolutionary in the classroom. A Boston superintendent describes the benefits of the slate: "if the result of the work should, at any time, be found infelicitous, a sponge will readily banish from the slate all disheartening recollections, and leave it free for new attempts" (Dunn, 2011). The school slate was later accompanied by the chalkboard, an innovation which still persists in classrooms around the world.

By 1900 the mass production of pencils and papers began to replace the school slate and it was not until the early 1940's that they were accompanied by the ballpoint pen (Wilson & Meek, 2010). Pencils remain a staple in nearly all classrooms and school bags and any child today will tell you the importance of having a sharp No. 2 on testing day.

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2 + 2 = 4

"How can I trust your information when you're using such outdated technology?"

Hornbook 1650
Wooden paddles with lessons imprinted. Popular in colonial times

Magic Lantern 1870
Precursor to the slide projector. After WWI Chicago Schools had over 8,000

Radio 1925
NYC Board of Education sends lessons to schools on a radio station. "Schools on air" reached millions of Americans.

Case Study: The Typewriter

Typewriters began to appear in the 1870's and as soon as the 1890's articles by William. A Mowry and Frank Palmer advocated for the use of typewriters in secondary-school curriculum (Cothran & Mason, 1978). In the 1932 a large study consisting of 14,947 students and conducted by Ben D. Wood and Frank N. Freeman showed that children who only spent an hour or two a week at the typewriter outperformed non-typing students in reading at the end of the year (Wood & Freeman, 1932). Subsequent studies conducted throughout the 1930's - 50's continued to show student improvement in reading, vocabulary and writing. Yet the success of the typewriter is also a story of the quick progression of technology. Smith Corona, the leading manufacturer of typewriters, showed a steep decline in sales during the 1980's and declared bankruptcy by 1995 (Baron, 2012). In a little over a century, the typewriter went from innovative and progressive technology to obsolete and, as we know, advancements in technology are progressive more rapidly than ever with no signs of slowing down.
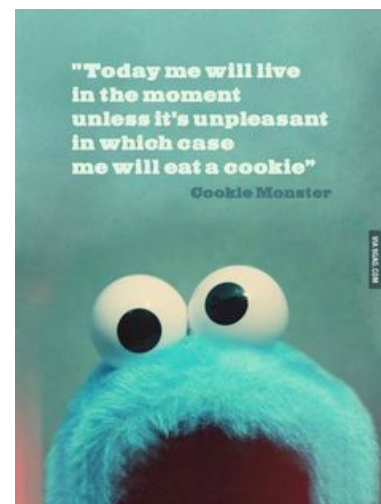
Washington, D.C., circa 1923. "Eastern High School typewriting class."

Mimeographs, Educational TV, Graphing Calculators, Oh My!

In 1940 the mimeograph came along, and teachers everywhere breathed a sigh of relief. The mimeograph was able to make copies by hand-cranking out copies that had a distinct purple ink and a pungent odor (Santosus, 2001). The mimeograph managed to stay in schools for a few decades before being replaced by the Xerox machine in 1959. While photocopiers are still commonplace in schools, it is slowly becoming obsolete as digital copies become more prevalent (Dunn, 2011).

Remember *Sesame Street?* The iconic show debuted in 1969 and began the trend of educational TV, by the 1970's there were over 50 educational TV programs being aired nationwide (Dunn, 2011)/lkn. *Sesame Street* has won over 100 Emmy's and continues to air today (though it has moved to HBO) (Cashill, 2016).

The graphing calculator comes from a long line of mathematical aids in the classroom. One of the first being the legendary slide rule, which was popular in the 50's and 60, but became obsolete in 1974 with the introduction of the electronic calculator (Dunn, 2011). The graphing calculator, introduced in 1985, made far more advanced mathematics accessible for the classroom.

"Today me will live in the moment unless it's unpleasant in which case me will eat a cookie"
Cookie Monster

Interactive Whiteboards (IWB) For Everyone

Interactive Whiteboards (IWB) were introduced to the classroom in the late 1990's. Since their implementation, IWBs have impacted the lives of students across the nation and have served as an introduction to other types of information and communication technologies (ICT), such as iPads. IWBs have also served another vital function, they have sparked a rich conversation around the use of digital and social technologies in the classroom.

Most educational technologies that are found in classrooms today fall under the category of ICT, which are defined as "any product that can store, retrieve, manipulate, or transmit information electronically in a digital form" (Firmin & Genesi, 2013). These products include Microsoft Word, cameras, email, Photoshop, and, of course, the Internet. As ICTs become more and more prevalent in the classroom, it is important to remember that these technologies are tools, and they in no way a substitute for a great teacher.

"Technology will never replace great teachers, but technology in the hands of great teachers is transformational." ~George Couros

I don't care that everyone is using ROTFLMAO, you need to use complete words for your homework.

The Future is NOW!

So what technologies are we using in classrooms today? Currently iPads, 3D printers, and the concept of Gamification are just a few of the many ways modern tech is infiltrating the education system (Perez, 2016).

But what does the future hold? Rumors of virtual reality that can take students on field trips to the moon may not be far off.

Proponents of augmented reality see students wearing glasses that bring books, works of art, and math to life (Dunwill, 2016).

Some educators even see the format of the traditional classroom changing. Different work stations for individual and collaborative work will be available, as will standing desks for students who dislike sitting and accommodation for students who need movement (Dunwill, 2016).

1	2	3
IPADS	**GAMIFICATION**	**3D PRINTING**
iPads can act as an interactive interface for students where they can access learning materials, specialized programs, and discussion boards.	Gamification is the concept of applying game-design principles to classroom learning through a reward based system.	3D printers produce working mini-models to test engineering design principles.

Ever since they introduced VR in the classroom, Sally can't wait to go to school!

So What Now?

Change is hard, and change in the classroom can be even more difficult because not only are you changing the practices of the teachers, some of whom have been using tried and true methods for years, but you have to change the expectations and curriculums of the schools as well as teach students new ways of learning. As stated by M.W. Firmin and D.J. Deanna: "While technology use is valuable and desirable in today's classrooms, there is a fine balance between spending too much time using technology and too little time using educational technologies."

Yet the value of certain technologies is nearly impossible to ignore. 3D printing produces mini-models for budding engineers to see, handle, and experiment with. iPads allow students to access learning material that was unavailable to them before, and new education apps are constantly being produced that allow students to learn at their own pace.

Perhaps one of the most important aspects of this ongoing conversation is to simply keep an open mind. Not all new technologies will be beneficial and there are definite obstacles to implementing many of them in school across the nation. Price, training, and availability all play a role in placing these new teaching tools in the hands of students.

From the Editor's Desk

I attended high school at Alexander Dawson School in Lafayette Colorado. While I was a sophomore, the middle school implemented a program, in conjunction with Apple, that placed an iPad in the hand of every middle schooler. In the classroom, there were mixed results. Teachers found success in assigning individual projects in which students researched topics of their choice on the iPads, there were apps for science experiments, such as dissection, and students no longer had to carry heavy textbooks as they were all available on their iPads. Yet, there were also multiple technical problems. Many of the apps they were attempting to use would often crash, refuse to work, or were simply not what the teachers had expected.

Perhaps the most interesting aspect of this experiment was the immediate change it had on the students. Students were infatuated with their new iPads and the hallways that were once teeming with conversation and social interactions were now silent as students sat against their lockers and focused on their individual iPads. It was due to this social change, and not the technology itself, that the entire program was halted and extensively revised.

I also worked at a summer camp that taught Scratch, an MIT programming software designed for children, to children ages 7-12. Scratch taught students how to program and it was flexible enough that the children picked it up extremely quickly and were able to make games, movies, slideshows, and even program robots! I saw the creativity of these children reflected constantly in their work. One student created a program on which you could learn to play the guitar by pressing different keys that corresponded to frets and strings. Another student created a beautiful movie that had abstract art and a moving storyline that nearly brought me to tears.

But I think the most amazing part of this experience were the students themselves. In a classroom of 15-20 children with 4 tutors the students learned to rely on each other for help. Students who began the week as shy and quiet would be conversing animatedly with friends as they created multiplayer games. The more advanced students really enjoyed teaching their peers and it was such a wonder to watch them all grow together.

I believe it is the duty of the education system to give our students the tools they will need in order to succeed. In a world that is changing at an unprecedented rate it is becoming increasingly difficult to keep pace with the rapid advancement of technology. Yet I believe it is of the utmost important that educators seek to integrate technology into their classroom in meaningful ways.

Images

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8) Retrieved from http://andrewbrennandesign.com/wp-content/uploads/Scantron-Test-Illustration.jpg

Works Cited

Baron, D. (August 2012). It's Not National Typewriter Day. *The Web of Language.* Retrieved from https://illinois.edu/blog/view/25/78474.

Cashill, R. (2016). The Evolution of Sesame Street. Retrieved from http://www.biography.com/news/sesame-street-history-hbo.

Cothran, A., & Mason, G. (1978). The Typewriter: Time-Tested Tool for Teaching Reading and Writing. *The Elementary School Journal, 78*(3), 171-173. Retrieved from http://www.jstor.org/stable/1001415

Dunn, J. (2011). The Evolution of Classroom Technology. Retrieved from http://www.edudemic.com/classroom-technology/

Dunwill, E. (2016). 4 Changes that will Shape the Classroom of the Future: Making Education fully Technological. Retrieved from https://elearningindustry.com/4-changes-will-shape-classroom-of-the-future-making-education-fully-technological

Firmin, M.W., Genesi, D.J. (2013). History and Implementation of Classroom Technology. *Procedia – Social and Behavioral Sciences, 93.* Retrieved from http://www.sciencedirect.com/science/article/pii/S1877042813035349.

Kalmbach, J. (December, 1996). From Liquid Paper to Typewriters: Some Historical Perspectives on Technology in the Classroom. *Computers and Composition, 13(1), 57-68. http://dx.doi.org/10.1016/S8755-4615(96)90035-3*

Perez, P. (2016). 7 Must-Know Classroom Technology Trends that are Changing Education. Retrieved from http://www.securedgenetworks.com/blog/7-must-know-classroom-technology-trends-that-are-changing-education

Santosus, M. (2001). A History of the Mimeograph. Retrieved from http://www.cio.com/article/2441286/infrastructure/a-history-of-the-mimeograph.html.

Savvidis, P. (2016). The Evolution of Technology in Schools [Infographic]. Retrieved from https://www.webanywhere.co.uk/blog/2016/01/evolution-technology-schools/

Veronese, K. (2012). The Birth of Scantrons, the Bane of Standardized Testing. Retrieved from http://io9.gizmodo.com/5908833/the-birth-of-scantrons-the-bane-of-standardized-testing

Wilson, C., Orellana, M., & Meek, M. (September, 2010). The Learning Machines [Slideshow]. *The New York Times.* Retrieved from http://www.nytimes.com/interactive/2010/09/19/magazine/classroom-technology.html.

Wood, B. D., Freeman, F. N., & Typewriter Educational Research Bureau. (1932). *An experimental study of the educational influences of the typewriter in the elementary school classroom*. New York: The Macmillan Company. Retrieved from https://babel.hathitrust.org/cgi/pt?id=uc1.b3978312;view=1up;seq=9

Yancey, K.B. (February, 2009). Writing in the 21st Century. *A Report from NCTE.* Retrieved from http://www.ncte.org.