You Snooze, You Lose
How Technology Education is Key to Today's Students

By Diana Wanek

Oh how our world has changed over the last 100 years. We have seen the likes of such inventions as the motion picture, the zipper, penicillin, the artificial heart, and scotch tape. With the youth of today growing up on the heels of these advancements, and more recent innovations such as hybrid cars, iphones, E-readers and robot surgery, I believe our future society will push the envelope in advancements of technological discovery and innovation. Therefore, as educators, we need to prepare our students for this future. I understand the concerns of some in our culture who want to steer our youth away from spending their free time in technological pursuits. I understand the caution of those who would like to prevent the influx of technology education into the current education system. However, if we do not prepare our students now to step into the world of the future, we will be undermining their stake in the global community we Americans have helped to create.

It is the intent of this paper to look at several sides of the issues of technology in education: to look at the information of the likes of Nicholas Carr, Mark Bauerlein, Colleen Cordes and Edward Miller, all opponents of the trajectory of technology in our current world and in our educational system. However, this paper will help bring into balance our thoughts by including the thoughts of Richard Saul Wurman, Milton Chan, Thomas Freidman and others as we look to strike a balance in our thinking in references to technology education for our youth.

When referencing the use of technology in this paper, I will be maintaining that technology is not strictly 1:1 computing for our students. Technology in education can encompass many various uses of digital devices within the classroom. In a article by the Alliance for Children entitled,- *FOOL'S GOLD: A Critical Look at Computers in Childhood Technology* by Colleen Cordes and Edward Miller, their references to technology focused

specifically on the concerns of 1:1 computing and the use of laptops in education and their negative impacts on students. While I agree with some of the evidence put forth in their research and agree that their research sheds light on issues of computers in early education, I cannot overall accept their conclusions that all technology education for students is inappropriate. Throughout this paper, I will address the concerns raised by Cordes and Miller when it comes to computer use, yet at this point, I will point out that it is my belief that technology in education can be the incorporation of many devices to extend the walls of the classroom as well as the experiences of the students. Technology use can also offer support to teachers with more tools for educating our youth. These various technologies can be a benefit to the education of our students for the future and assets to the teachers now.

When looking at technology education for our younger students, it is believed by some that there are more negatives than positives with the implementation of such a program. *Fool's Gold* asserts money allocated to a national technology program could be more wisely spent than investing in technology purchases and the maintenance of such programs. The same authors refer to the negative physical effects of using computers at such a young age. Cordes and Miller point out the effects of commercialism and the need to protect the innocence of a young person's childhood as well as bolster the belief that children need to be allowed to enjoy their childhood rather than be forced to produce products meant for the adult world using adult programs. Other opponents to technology in our society are authors Nicholas Carr and Mark Bauerlein. Both feel that today's youth are consumed by their ever-present use of technology. Carr and Bauerlein see this technological world as a detriment to our society and the future of our world. Youth today lack the necessary skills to think independently and concentrate according to Carr, author of *The Shallows What the Internet is Doing to our Brains*. Bauerlein, author of *The Dumbest*

Generation, goes on to say, "The youth of today have far more resources than that of the teen in the 1950's, yet research shows knowledge and skills haven't kept pace, and the intellectual habits that complement them are slipping" (p. 32). I acknowledge that some of the arguments of Cordes, Miller, Carr and Bauerlein are accurate and need to be addressed. However, I question the logic of completely eliminating the technology program rather than addressing the individual concerns brought forth by these authors. If we can agreethat our world is indeed changing and the advancement in technological innovations have surpassed our wildest imagination, and if we can acknowledge that our country may no longer hold the trump card when it comes to innovations and competing in this new global economical market, we then have to look to the future for our solutions. Thomas Friedman, author of *The World is Flat*, believes that the world is becoming "flatter" and more competitive. As the walls come down in other countries like Russia, India, Latin America and China, more people enter the workforce, and competition for jobs gets stiffer. We must work to stay ahead of the game. Therefore, our educational system needs to evolve and stay ahead of the trends and work to prepare our young people of today to enter this flat world. Our students need an education that provides them with the necessary skills to enter this very competitive workplace upon graduation. Students need to be highly trained and qualified. That includes, but is not limited to, a better technology education. Freidman states in his book, “Parents used to tell their children to finish their dinner because children in Africa were hungry for their food. Today they should tell their children to do their homework since children in Asia are hungry for their jobs” (The World is Flat, 2005).

Looking at the educational system of the United States in the 21st century as Dr. Allen Gleen, professor and Dean Emeritus of Education at the University of Washington, states, ‘‘The biggest obstacle to school change is our memories. We all think we know what a school is and

how a classroom is organized, since we spent eighteen years in them during our formative years" (Chen, 2002, p.11). Since changing our thinking can be the most difficult thing we human beings can do, especially when our opinions are firmly rooted in personal experience, it makes it difficult to see how we can look to the future and turn our backs to our past. However, if from the early formative years through graduation we are to prepare our students to hold a place in this ever widening workforce, this very global world we have created, we must bring technology into the classroom setting. Furthermore, the ability to access technology, navigate online, and communicate and collaborate with others has become increasingly central to our everyday lives. These two factors alone tell us that technology education is no longer optional.

I will surrender to the fact that technology is not the silver bullet to save our struggling educational system. I agree with the evidence of these authors; caution, and awareness needs to be of the utmost importance when implementing a technology program. However, a technology program can be implemented without students spending endless hours in front of a computer, as asserted by both Carr and Bauerlein. Technology integration can be addressed without overlooking the health concerns placed on our youngest students, as expressed by Cordes and Miller. Even at the elementary level, I am not suggesting endless screen time with limited changes to play, interaction, and moving about. I am not proposing technology instruction cut into physical fitness, reading, music, or art. Rather, I am advocating that a balance in all subject matter be struck. Technology needs to be integrated in developmentally appropriate ways with each grade level. It is not a choice of one curricular subject over another; rather technology needs to be viewed as an additional tool, not a replacement tool. It needs to be a conscious effort to make available to our youth all the necessary skills for their future. I propose we look to Milton Chen is suggestion in his book, *Education Nation,* of taking the best elements of what has

been, integrating diverse sources of knowledge and talent, and creating a breakthrough that hasn't been imagined before in the classroom and the education of our children (Chen, 2002, p. 25). Albert Einstein is credited with this statement, "The definition of insanity is doing the same thing over and over again and expecting different results" (Chen, 2010, p.21). Our education system is not preparing our student to step out into the world ahead of them. We need to offer our students a climate in which to thrive, a climate that engages our students, a setting where our students are exposed to relevant and current applications where students no longer ask, "Why do I need to know this?" Students need to be offered stimulating educational opportunities that lead to transferable skills. Students will learn more deeply when they can apply knowledge gathering in the classroom to real-world problems and experiences. John Dewey, American philosopher, psychologist and educational reformer, wrote about education over 100 years ago, but we can still see the strength of his statement today when it comes to the education of our youth. Dewey (1899) wrote, "From the standpoint of the child, the great waste in the school comes from his inability to utilize the experiences he gets outside the school in any complete and free way within the school itself: while, on the other hand, he is unable to apply in daily life what he is learning at school" (p. 89). It is out of this authentic instruction that we then apply authentic assessments that have the ability to give ongoing feedback to teachers on the students' understanding and their ability to perform at a much deeper level than the state mandated multiple choice testing currently supported with the NCLB act.

I am of the belief that technology needs to be intermixed with core curriculum. Students need to work individually and collaboratively using a variety of technological devices. Students need to be directed by the teachers towards understanding, then allowed to explore with assistance from the teacher. I am in agreement with Carr and Bauerlein that technology

instruction is not the only solution to our failing education system and preparing our youth for the future. Conversely, with technology integration we can retain those aspects of the current education system that are proving successful in the education of our youth and preparing them for their future role in society. I am, however, proposing that we rethink the role of the students, teachers and parents with the opportunities of technology today.

Cordes and Miller express concerns for the commercialism and the exploits of our youth with the use of computers. Again, I feel that a quality program would address these concerns. I also advocate that the responsibility for some of the concerns of Cordes and Miller falls outside the realm of the educator. This is where parents can become involved in the decisions and supervision of their own children. The role of the educator is to instruct, train, and prepare the students for their safe technology experience. The role of the teacher is not to parent. The teacher can support the education of the parents about the pitfalls of technology outside the school setting, yet it is the role and duty of the parents to nurture, protect, and direct their own child outside of school in proper decisions and choices regarding the use of technology. As Howard Rheingold endorses, "The health of the online commons will depend on whether more than a tiny minority of Net users become literate Netizens" (Rheingold, 2010, par.12). With digital technology here to stay, individuals need to take responsibility and control for the effects of the Net in our own lives and with our children. Every advancement in technology brings pros and cons, risks and rewards. Not moving forward for fear of the future is not a future. Parents need to be an integral part of preparing their children for a safe, happy and healthy future with technology. Technology need not be seen as a divisive tool when it comes to interaction between students and adults, but rather a way to promote interaction between the generations and encourage family connections.

Cordes and Miller suggest that funds allocated to technology and its maintenance would be better spent on more critical social needs. I will concur that our society is in crisis, and there are many needs that necessitate funding. To disregard the investment in our country's future and the future of our youth is not a plausible solution. Calling for a moratorium on technology education programs is a disastrous option. We live in a very technology driven world. Carr agrees, the Net has become essential for work, school and our social lives. Carr goes on to state, "The Net is a thoroughfare of business and commerce" (Carr, 2010 p. 85). It is true that we no longer live in an industrial economy. We live in a knowledge economy. We have to think about education in a different way. Therefore, being in agreement with Carr, we need to look at better ways to train and educate our youth for this technological world they will soon be active participants in. We cannot ignore the fact that technology is here and here to stay. Thus, it is our responsibility to our future generations to ensure that every American has an understanding of technology and how it works, as well as appropriate uses of technological devices and their applications, in order to be an active participant in a world where decisions are made based on technology both now and for the future.

Having addressed the concerns and pitfalls pointed out by Cordes, Miller, Carr and Bauerlein, we can look to build a future technology education program that is both safe and beneficial to our youth. When we look to our young people, we see them as digital natives growing up in a world where they know no difference. This generation will also be a very global generation as the communication and collaboration within the workforce stretches across this country and into other countries across this planet. Today's children have international experience at their fingertips earlier in their childhood (Chen, 2002, p 58) With technology instruction beginning in kindergarten, when exploration, discovery, and curiosity are naturally

high, students can begin their understanding of technology, and a strong base for the future instruction can be built. At a young age, children can develop a self-concept of perseverance and an, "I can do this, I can learn this" attitude. Attitudes and self-concept, as well as self-motivation, can be developed early in a student's life through the integration of technology education in the classroom. These attitudes and qualities are transferable skills for lifelong employment in any workplace. Positive effects can be seen when a technology program is integrated in a constructive and appropriate way with our children.

Beginning technology instruction at the elementary level allows for early development of technology skills where students are hungry for technology activities and instruction. Starting technology skills at a young age and introducing students early on to technology will allow them to focus later on the content in the curriculum. Though advancements will be made within the devices students currently use, I believe that the confidence obtained and the skills acquired will be easily adaptable to the devices of the future. Carr points out himself that our brains are always in flux. Our brains will flux with those changes around us and will adapt. James Olds, professor of neuroscience, (as cited in Carr, 2008), reaffirms Carr's belief that, "the brain has the ability to reprogram itself on the fly, altering the way it functions." At a young age, the schema for students is wide open for building new foundations for understanding. This is a time when those foundations can be laid for many years to come, and a place where equality in schema development can begin. Our own country struggles within its own borders to eliminate the digital divide between our students of race and socio-economical status as well as gender and regional divides. Introducing technology instruction and providing continued support for technology education for all students in a K-12 setting will help to eliminate the separation of "have and have not's" when it comes to access to technology in our society. Offering technology instruction

at the elementary level allows a place where the playing field can be leveled. Schools without technology programs will divide the "haves and have-nots" in our society. When a quality technology education is not offered to all, wealthy students will be the only ones to pursue educational opportunities outside the school setting. For others who cannot afford these opportunities, the gap will continue to grow wider. Students will continue to fall farther behind their peers. We must overcome these digital divides within our own country's educational system to prepare all of our youth with equal technological instruction. The US Department of Education needs to see that all children are receiving equal education opportunities when it comes to technology education. A foundation needs to be laid for all students to be lifelong learners with our current and future technological devices.

The studies of Spires, Lee and Turner (2008) found that children of today create, understand, and learn things in a different way than those who have gone before them. Children of today are less intimidated when it comes to using technology. They were born into a world of technology. Thus, our educational system needs reforms to include technology instruction for all students. One way to alter our current educational system is by including the use of the everyday media devices that students are using afterschool during the school hours. In a well thought out and planned manner, the integration of technology into the core class curriculum can enhance and extend the current lessons being taught. With the use of technology, students can go deeper into the current lesson; they can have individualized instruction for advanced learning as well as lessons designed for remedial learning. Offering technology instruction at the elementary level offers opportunities for a rich classroom. Yu-Mei Wang, associate professor in the School of Education at the University of Alabama Birmingham, notes that technology rich classrooms are student-centered classrooms, not teacher-centered classrooms(2002). However, it is understood

that having the tools in ones hands does not guarantee proficiency. Having the right curriculum and skilled teachers is essential and currently lacking in our schools, a point brought out by Cordes and Miller(2000), and again, an issue that I agree needs to be addressed. Preservice teachers need to be receiving instruction to enter into the educational field highly qualified to integrate technology, as described above, into the classroom. Current teachers need both support from their colleagues who currently use technology and from their administrators as they learn to integrate technology into core curriculum. Teachers need time to plan, collaborate, and prepare a curriculum that is both authentic and rich. They need time to put in motion authentic assessments of common core standards as well as technology standards. Technology learning needs to be active and not passive for students. Teachers need to see their role a assistants to a student's learning rather than the previous role of dispensing information. Students in turn will become more responsible for their own learning. The use of technology in the classroom setting is key to the interest level of student learning. Richard Saul Wurman (2004), author of many bestselling books and creator of the TED talks states, "You will not learn things and remember them if you are not interested in them" (interview, January 2004). The integration of technology into the classroom draws the students' interest level to new heights when exploring topics that have been taught to students in previous ways. The infusion of technology adds the level of interest that today's students need. Wurman goes on to say "The education system is bankrupt because what is taught is not what students are interested in. (2004). George Leonard, senior editor of Look magazine, supports Wurman in his statement, "Learning is not taught in a way that can accentuate the interest of students. Education should serve the natural curiosity of children, it should emphasize that learning is fundamentally a joyful activity." (Chen, 2002, p. 18) Leonard believed that school should be made exciting, challenging, and vivid. Computers

should be used in a way to stimulate interactions between students and peers, as well as increase a students' thirst for knowledge. I agree that every day should be a teachable day. Every day should be a day to integrate technology within the school setting.

As educators and parents, we would scoff at the thought of expecting our children to learn to hit a ball, throw that winning touchdown pass, or perform a ballet move having only read about it in a book or heard a lecture on how to best accomplish this skill. Why then do we consider settling for anything less than offering hands on technology education to our young people? Would it be enough for basketball players to say they read about how to shoot a free throw? If we would not be willing to accept this with the acquisition of sports skills, why then are we willing to accept less when it comes to technology instruction and technology skills? I recognize, that with a technology program in our schools, that we will need to balance and plan for the success of our students, teachers, and the program, but to accept a state of digital lockdown will not prepare our students for the world.

In conclusion, let me repeat that technology is not the save all of our educational system's woes. A technology program is just one piece of the puzzle to solving the situation our country finds itself in as part of this new "flat world" that Thomas Freidman (2005) alludes to. Just as innovations have lead us to hybrid cars offering fuel options for today's world, innovations in our educational system can also offer us new options. In education wars, a cease fire needs to be called when it comes to the battle of implementation of technology into our educational system. We need to give up our opinions rooted in our personal experiences. As Milton Chen (2002) suggested in his book *Education Nation*, we need to move beyond our way of thinking as ‘‘either/or’’ education and think of technology in education as ‘‘both-and.’’ A technology program at any grade level comes with its own set of concerns and cautions. In knowing this, we

have the ability to address those issues head-on and do our best to educate, protect, and empower our youth while preparing them for their future. Let me leave you with one last observation as we make the choices regarding technology education for our students of today knowing what they face in the future. Again taken from Milton Chen's book, *Education Nation,*

> Let's have a little competition at school and get ready for the future
> I will use a laptop and you will use paper and pencil. Are you ready?
> I will access up-to-date information. You will have textbooks that are 5 years old.
> I will immediately know when I misspelled a word. You will have to wait until it's graded.
> I will learn how to care for technology by using it. You will read about it.
> I will see math problems in 3-D. You will do the old problems.
> I see and create artwork and poetry and share it with the world. You will share yours with the class.
> I will have access 24/7. You will have the entire class period.
> I will access the most dynamic information. Yours will be printed and photocopied.
> I will communicate with leaders and experts using email. You will wait for Friday's speaker.
> I will select my learning style. You will use the teacher's favorite learning style.
> I will collaborate with my peers from around the world. You will collaborate with your peers in your classroom.
> I will take my learning as far as I want. You will wait for the rest of the class.
> The cost of a laptop for a year? $250.
> The cost of teacher and student training? Expensive.
> The cost of well-educated U.S. citizens and workforce? Priceless. (p.96)

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