

# Chapter 1

## Needed: A Revolution in Learning

*“Technology and our human potential are the two greatest challenges and adventures facing humankind today.”*  
– *From John Naisbitt’s, Megatrends*

It is often possible to discover change in the world through books. In my case, I had read a classic from the 1980s – *Megatrends*. It’s a fascinating book because it hints at all the parts of our lives that will be influenced by technological change. Megatrend’s author, John Naisbitt, claimed that as we moved into a new information age, there would be a major impact to every aspect of modern-day life, work and school<sup>1</sup>. And it is true that computers and technology have most certainly infiltrated most every aspect of our lives. However, in regard to teaching and learning, technology seems to have created an equally strong pressure against change. In fact, there are many people who really don’t want technology to have a major impact on learning.

Specifically, everyone is aware that there is a special relationship that occurs between a teacher and a student. Many students have been especially impacted by a special teacher in their lives. Teaching and learning are two of the most primary connections people have with one another. Nobody really believes that technology could replace this powerful relationship between a student and teacher, and no one would ever want to break this important bond.

Yet, in many un-predictable ways, technology *is* encroaching upon teaching and learning. People are increasingly acquiring information from the Internet. They are viewing videos and instructional web-content in greater numbers, and they are spending exorbitant amounts of time playing video games and interacting through social media.

While these activities may not be wholly considered “academic”, their methods are so motivating, that many educators are beginning to really take notice.

Strong motivation has always been considered a key reason for successful learning, but it can be woefully lacking within education, especially in the higher grades. So perhaps it could be possible for technology to provide a motivational component to learning, while also helping to meet the new learning challenges of the information age.

But what exactly are the challenges in the information age, and how are they impacting teaching and learning? According to *Megatrends*, it is really that excess information and complexity are being thrust upon us. Nesbitt notes that people are “drowning in information but starved for knowledge.”<sup>ii</sup> I can give a personal example of this. I remember when my kids were younger, we went to McDonalds to buy them a “Happy Meal”. I was surprised to find a toy in the Happy Meal box that not only included batteries to install but also a small instruction manual!

All this made me realize that even the most commonplace devices today are amazingly complex. Nobody is really learning anything by trying to quickly get a happy meal toy up and running only to have it discarded or broken a few hours later. This is maddening! Within our daily lives, we are confronted with a bombardment of information that we process weakly. It seems that in the information age, there is a need for continuous but unstructured brainpower.

### **Technology Allows for Control**

However, there can be one strong solution to the information overload problem, and it is *control*. When people play specific video games of their interest, surf the Internet in a self-directed fashion, or interact with others through social media, they are in control what they are doing and learning. Having direct control over our learning can be a powerful step forward to combatting the information overload problem.

We all know that classroom learning does not, for the most part, provide any real control. The teacher and school district determine what is contained within the curriculum. With most computerized applications, however, the control of learning is

with the user. They are free to choose what programs they want, skip to the topic or levels they require at that time, and pursue learning to the degree (deep or weak) that they feel is important to their needs.

In a sense it could be considered as a double-edged sword. Technology is making life more impersonal and complex, but technology is also providing the means to simplify this loss of personal connection and complexity. When control is introduced into the learning process, personal interest and meaning are included which can be one of the most motivating things that people know. The important aspect to this fact is that knowledge and skills build on one another. It is not the random bits of information that are thrust upon us that are retained and utilized; it is our specific and personalized knowledge which is built from ground up and continues to grow.

Unfortunately, this is not how public education is directed in this country. We, as a country, are pushing standardized learning to a larger degree in education. But, historically in America, there had been little standardized learning because curriculum had always been set locally. This had allowed teachers to align the content of their lessons to the specific interests and backgrounds of their students. In fact, the unique “openness” of the U.S. education system had frequently been cited as the reason it was always considered the best in the world. This fact was noted in one very interesting book, *The Race between Education and Technology*, by Claudia Goldin and Lawrence F. Katz. According to Goldin and Katz, the U.S. public education system was flexible enough to allow anyone to get ahead.

If an open and forgiving system gave disadvantaged and errant youths a second chance, then the insistence on standards and accountability of many European systems reinforced a caste system. It is, in part, for these reasons that we deem the features of the U.S. educational system as virtues<sup>iii</sup>.

In addition, Goldin and Katz state that an open and non-standardized education system allowed for a better response to technological change.

When technology advances rapidly, flexible, non-bureaucratic, decentralized institutions that are not beholden to a single funding authority are in a better position to respond. With the explosion of scientific fields in the post-world War

II era, U.S. institutions were far better situated to adapt than were the more inflexible institutions in Europe<sup>iv</sup>.

It is for these reasons that educators should begin to consider making— at least some components of – education *less* standardized instead of more standardized. The Information Age is putting a large pressure on the educational community to adapt and adapt it must do. We need technology in learning to allow teachers and students to have more choice and control in the learning environment.

### **From Pedagogy to Andragogy**

The role of formal education had always been to impart the important academic skills of the 3 Rs: reading, writing and arithmetic. It had historically not been intended to teach the specific skills required for work or life. Malcolm Knowles (1913-1997), a pioneer and leader in the area of adult education, explained this notion when he pointed out the differences between *pedagogy* – the education of children, and *andragogy* – the training of adults.

Knowles created the term andragogy in the mid 1970s to bring attention to the fact that successfully training adults was an entirely different process than that of educating children -- the word pedagogy itself starts with “ped”, which means child. Knowles emphasized the word “training” for adults over the word education. By doing this, he implied that the learning should be more tailored to the exact career objectives or life goals of the adult.

According to Knowles, pedagogy is centered on certain teaching techniques; it is focused on the fact that learners are mostly passive recipients of information, that their experiences outside of the educational environment are of little or no value, that the learners conform to a standardized curriculum, and that content be essentially of a theoretical nature.

Andragogy, on the other hand, requires that learners be active and interested participants in their learning, that they possess a rich storage of life experiences that can be used in the learning environment, that the curriculum be tailored to the needs and

interests of the learners, and that content should emphasize applications which are both concrete and relevant to the learners' situation<sup>v</sup>.

In the industrial age (and before), the education of children and adults had always been different. Children went to school to learn basic knowledge and skills. After school ended, the students went their own way to learn what was required for "life's work". In today's world, however, students must begin to prepare for life's work before they finish high school, and there must be ways for them to continue to learn after high school has ended. It is generally agreed that a high school degree is no longer enough for students to gain and retain life-long employment.

Although this increased need for knowledge and skills may seem overwhelming to many, as Nesbitt points out, the information age can be extremely liberating. In the past, individual circumstances were pretty much determined from birth. There was little upward mobility. If individuals were born to farmers, they generally became farmers. If they were born into poverty, they mostly stayed in those lower social classes. For today's generation of workers, knowledge and skills are the means to success, not class or circumstances. This makes, as Nesbitt says, "access to the economic system much easier<sup>vi</sup>."

### **The Need for Life-Long Learning**

Previously, acquiring work skills entailed looking to the past to gain the techniques of farming or a trade. These same skills were passed down from generation to generation. Now, gaining and maintaining work skills requires peaking into the future as technology continually redefines the workplace. In this case, modern education must be a cultivation of a standardized *and* an individualized set of knowledge and skills. In an increasingly diverse and competitive global workforce, a one-size fits all prescription for education achievement is no longer adequate.

Specifically, there must be a transformation from instruction that is only delivered to students in groups to some instruction that is delivered directly to the individual. In the new learning environment, learners must take a more active role in the learning process,

and there must be more of a selection of learning opportunities from which they can partake.

Individualized learning must especially be a part of life after formal education. Training and re-training had traditionally been paid for by business or by the government, but in an increasingly competitive labor market, people need to be increasingly in-charge of their own re-training. According to Richard Nelson Bolles, author of the massively best-selling book, *What Color Is Your Parachute?*

The important thing to remember now is that as large numbers of jobs are disappearing, ‘whole new categories of jobs are being created that nobody even thought of before,’ [For displaced workers] it is time to think harder about transferring the skills you have or acquiring new ones to move into a new type of job or industry. Be receptive to the idea that in the future you may be working ‘in the service of new technologies.’ With the right attitude, job seekers can often turn a crisis into a real advantage for themselves’ by moving their life in a new and more fulfilling direction <sup>vii</sup>.

It is true that the all-encompassing words within education reform today are accountability and standards, but I think the emphasis should be on a different word – motivation, because it can certainly be argued that when learners are motivated, especially older learners, many of the other achievement problems go away. Although not usually considered, motivation is a key component to successful learning for adolescents and adults, and it needs to be central to any learning plan to ensure life-long learning.

As an example, the U.S. Army designed a computer game to enhance motivation. Faced with reducing enlistment, the Army created a computer game to give prospective recruits a “feel” for army life. Called *America’s Army*, it was created to convey the substance of army life while also being exciting and challenging to play.

Players go through basic training, advance to multiplayer games where they work in small units, and if they’re successful, move on to become Green Berets. They rescue prisoners of war, protect a pipeline, and thwart a weapons scale to terrorists. Players earn points not only for killing enemies but also for protecting other soldiers and for completing a mission with everyone in the unit still alive. If you try something stupid – for instance, gunning down civilians or ignoring orders – you can end up in a virtual Leavenworth prison or find yourself banished from the game altogether <sup>viii</sup>.

When events are directly experienced, a positive feeling is produced in the brain's emotional (limbic) center which causes learners to develop a positive attitude and subsequent increased motivation towards the event. Much evidence exists that "active" learning is more effective than "passive" learning and that it is far more meaningful and memorable.

### **More Technology for Adolescents and Adults**

Schools profess they teach to the individual but, in reality, academic success is really determined by how well a student does as compared to the group. It is a common phenomenon when some average students become outstanding leaders and innovators. It is sometimes the slower learners who show surprising success in areas such as artistic expression, entrepreneurial endeavors, and social leadership. Most likely this is because these abilities must be discovered and not necessarily taught or learned.

When children learn, their ways of learning are more similar than they are for adolescents and adults. Children do most of their learning in school, while older students increasingly direct their learning according to an area of interest or ability – whether it is in school or not. The same underachieving teenager who is doing poorly in school is, at home, composing music for a rock video, developing a web-site, or "hacking" into a computer system. Of course, these same types of real-world competencies can be easily simulated on a computer. They can challenge and excite the learner in new ways.

Modern society has largely been impacted by the advances of technology. These kinds of advances, however, have not occurred to the same extent within education. The primary reason for this is because teaching and learning are perceived to be distinctly human processes, and they cannot be easily duplicated through electronic means.

It is the intention of this book to present the case that teacher-student interaction may be vitally important for younger students, but it becomes less important for older students. By incorporating technology tools into the learning plan for adolescents and adults, it can gradually move them away from the standardized and dependent methods of pedagogy to the diverse and independent methods of andragogy.

Effective learning at the secondary level and beyond will only occur when each student's individual interests and abilities are taken into account, and when they have some control over their own learning. This is similar to how apprenticed tradesmen have learned work skills throughout the generations. When new information is presented according to real-world situations of relevance and interest, there is better learning.

The use of computerized learning is not intended to replace the traditional classroom setting; instead it is meant to be a complement to it, to enhance it, and to personalize it. After all, formal classroom learning has been around for at least a thousand years and has served us well. However, educational technology can make the educational experience more engaging, more relevant and more useful to the "adult" needs of self-enhancement. This is important as the world moves increasingly into a knowledge society.

Before the industrial revolution, few people attended high school, and they were mostly functionally illiterate. The industrial revolution made high school necessary. People needed to learn new skills to live independently in this larger industrialized world. Today it can certainly be argued that with the information revolution we are also living in an even larger world – a globalized one.

Additionally, in this information age, a high school degree is no longer adequate; there needs to be post-secondary learning for everyone. But with the sheer amount of information exploding in all domains, this post high school learning must become specialized and self-directed.

Through technology, anyone can begin to have a diversification in their learning that will best meet their needs and goals for the future. Effective educational software can be used to improve on traditional academic subjects, introduce new ones, and promote life-long learning by introducing some self-selection of material.

The most important point with adolescent and adult learners is that, as they grow older and more diverse, it becomes increasingly difficult and ineffective to teach them all in the same way in one classroom. Just as no one book will be enjoyed by every reader, no one learning event will be enjoyed or be effective with every learner. In addition to



regular classroom learning, there can and should be individualized, and self-directed technology-based learning for every student.

It is now time to explore the specific learning theories that will explain how technology can enhance learning. Technology, aligned with these psychological and adult learning principles, while also promoting individual control and motivation, can improve achievement for all older learners. This book will explain how.

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<sup>i</sup> John Naisbitt, *Megatrends: Ten New Directions Transforming our Lives*, New York: Warner Books, 1984, (p. 35 - 52).

<sup>ii</sup> John Naisbitt, *Megatrends: Ten New Directions Transforming our Lives*, New York: Warner Books, 1984, (p. 17).

<sup>iii</sup> Claudia Goldin & Lawrence F. Katz, *The Race Between Education and Technology*, Cambridge: The Belknap Press of Harvard University Press, 2008, (P. 132).

<sup>iv</sup> Claudia Goldin & Lawrence F. Katz, *The Race Between Education and Technology*, Cambridge: The Belknap Press of Harvard University Press, 2008. (P. 261).

<sup>v</sup> M.S. Knowles, *The Modern Practice of Adult Education: from Pedagogy to Andragogy* (Rev. Ed.), Chicago: Education Press, 1980.

<sup>vi</sup> John Naisbitt, *Megatrends: Ten New Directions Transforming our Lives*, New York: Warner Books, 1984, (p. 9).

<sup>vii</sup> Phyllis Korkki, “The Economy Changes, so Change with it”, *The New York Times*, April 20, 2008.

<sup>viii</sup> Daniel H. Pink, *A Whole New Mind: Why Right-Brainers will Rule the World*, New York, NY: Riverhead Books, 2009, (p. 190).