The more things change

By Thomas Cecil

The Prophets of the Old Testament wrote words on animal skins using dyes and stains. When Guttenburg created a machine that could write words faster, (especially the same words), he printed Bibles and the Prophets said this would change everything. Now more people will have access to words.

The typewriter could stack a lot of words on a page. It was easy to read and a much faster tool than the pen. This productivity tool again helped us communicate more efficiently. We could distribute words easier but not over any distance, at least not with any speed. So again we created a series of tools including the Pony Express, the Telegraph and the Telegraph-Typewriter or Teletype.

The spoken word found voice in the radio and soon images, like the illustrations in our books, were being sent out for free as television broadcasts.

The radio provided two way voice communication but radios were expensive, they took some special knowledge to operate, and there were problems with bandwidth. The telephone solved the bandwidth problem and was much easier to use. Soon everyone who wanted to communicate more efficiently by voice bought a telephone and paid a service provider for access to the phone network. We were assigned addresses or "phone numbers" to make sending messages and billing for services easier.

We are now at the dawn of a great new age. We can create mixtures of text, image and sound that dazzle the mind and spark the imagination. We can send these packages of information over great distances in short periods of time by means of another type of provider based network. Many are saying this new age is all about communication; it is not. It is about education.

Welcome to the Education Revolution.

The New Revolution

The tools we create to make our lives better do not define a new age, but learning how to integrate these tools into our everyday lives does.

The Agricultural Revolution was all about people discovering how to produce food. Food production became so easy that it fell from being the main job of almost everyone, to being, a job, that was done so efficiently, only a few people needed to do it. That left the rest of us free to explore other things.

The Industrial Revolution made it easier to move products, (like food), and people around. Trains, cars, planes and all of the things that make transportation work, came from a need to move products.

Since we all had more time, we wanted to fill that time with all the new things we had created. The Industrial Revolution is about making more, making it better, and making it faster. Again we end up with more time to better ourselves.
The Information Revolution was about what is out there and how we can obtain it. So why all of the sudden is information as sought after as things? Have we evolved into a society of philosophers and dreamers or does something else drive our need to know?

I am sure you know about Maslow's hierarchy of needs: First physiological, next safety and security, then social, up to ego, and finally self-actualization.

The idea is that we all have some basic needs but once they are met we still need more to feel happy. Maslow saw a pattern to these needs. The Industrial Revolution helped us to explore and expand the scope of our choices in fulfilling these needs. When the Horseless Carriage came on the scene I am sure some folks thought it was the beginning of the Transportation Revolution. But it was just a tool.

What defines a Revolution is a shift in societal importance.

During the Agricultural Revolution people's main need was food. During the Industrial Revolution the hierarchy shift for most people went from food, which was plentiful, to shelter and comfort. We built the military for safety and security, communities and cities to meet social needs, and we are now exploring how to satisfy our ego and self-actualization needs. For this we needed Information.

But now we have information. So much in fact that we are overwhelmed with how to use it all. And we do not want to waste it! So we are developing tools to use, exchange, organize and present this information.

Much of this information is old, created over centuries. More and more of it is new information being generated at exponentially greater rates. At the same time the quality of the information is going down. The need to sift through the information and separate the mistakes and sabotage is one of our newest challenges.

So what is the difference between today and yesterday if so much of the information is in fact nothing new? The difference is access.

Now words are not just for those who can afford the books or have unlimited time to spend in the libraries and archives. Now anyone with minimal means can gain access to this Information Oracle by means of the Information Super Highway. So why are we not all on board, what are we waiting for? Education.

The Education Revolution

People are trying to deal with more information every day and as the information heap grows people are getting lost. The needle in the haystack has become the person in the info-heap. There is so much noise we can't hear the music. We need to be leading others through the heap and exploring a way to the top and this should be our "top" priority.

This does not mean we stop teaching Reading, Writing, and Arithmetic. It does mean we learn to use the tools of today to do so.

At first we do simple things like replacing white boards with white screens and video projectors. We replace markers with computers, connected to the Internet. Now we can download live pictures from NASA to go along with that 20-year-old textbook picture of men walking on the moon. Graphic tablets will still let us write on the board to teach
cursive, but now we can bring up a spelling list or a quiz question from a file created with the lesson plan.

We need to have the skills to meet students on their own ground. That ground, for generation.com, is sometimes virtual and often found in cyberspace.

A Computer in every desk

We don't need a computer in every desk yet. The maintenance and upgrade costs might be a burden we can bear but even in the business world not everyone has his or her own computer. What they do have is access to a computer when they need it. Since access is the key to getting this information, computer centers in schools need to become as common as libraries. Computers used for the process of organizing, writing, and sharing ideas should be as available to students as pen and paper.

A computer center with two rooms, one that could be reserved by a teacher for whole class use and the other with unrestricted student access would be a great start. Thirty to forty computers in each room and a full time trained and certified computer technician to keep things running smooth and help students when they need direction.

We should encourage parents to have computers with Internet access in every home?

Not practical you say? Consider this. In the 1998-99 school year alone a local high school recycled or threw away over 400 computers. Half of these were too low on the technology chain to be useful in accessing the Internet, but almost half were able to run Windows 95 and could have been used for net access. Why were they not put into service? The demand for computers was not high enough to cause people to be willing to settle for one of these "old " machines.

We need to teach people how to access the information, what you can do with it once you get it, and why you want it. Once there is the desire to have access, any means of retrieving it will have value. Have you ever seen an old ratty car that runs and is safe to drive in a landfill? Not too often. Someone along the line knows that any working car has value. The same goes for computers.

So where do we start? Here is my 2-year plan. (One year would be better)

First install new technology in classrooms nation wide for the teacher's use. This should include a multimedia presentation center with Internet access and digital input from both a page scanner and a digital camera.

Next, provide pay incentive training for this equipment. Teachers with updated skills should receive a technology "bonus". Many schools already provide higher pay rates for continuing education credit. This would just add direction to what kind of education counts for credit.

Require everyday tasks like attendance to be done by computer. Provide software for things like grading. Provide software that easily integrates with mandatory grade reporting software. Remember that once a teacher is over the learning curve this needs to make them more efficient with more time for their students, not more added to their workload.

Show teachers how this technology makes their job better and more fun. If they don't want new technology skills, then don't waste funding on their pet projects. Put you money where your mouth is to promote new skills and new ideas.
If teachers want to use these new tools, and know how to use them, you will find them to be explorers and guides in cyberspace, instead of orange cones along the Information Super Highway.

How do we help our students?

Just like teachers they need to be using the technology every day. This means access to the tools and a requirement to use them. Papers should be typed, presentations should be multimedia and research should be on-line. Of course students need to be able to save data and have it easily portable from computer to computer.

Read Write CDROM drives should be standard on every computer and a school wide network with storage and Web Space should be assigned to every student. This also involves a whole new set of problems with homework because transporting data from home could cause virus and data security problems. The dog ate my homework will be replaced by my computer crashed and my disk got erased. We will have a whole new set of standards on how to fairly deal with these problems.

We should remember that industry deals with them every day and they have not thrown out all the computers yet. As a matter of fact they are upgrading so fast we have had a windfall of great computer systems from their recycling bins.

The schools are falling further behind the information curve every day. If we wait to work out all the problems before we fully integrate computers into the schools, we are likely to start seeing legislation that will send students and their government supplied funding to organizations willing to take the lead in teaching in this new frontier.

Finally, what about a computer in every desk. Yes in, not on. For computers to become useful tools they will need to truly become our notebooks. They will need to be small, fast, and reliable. They will need to be inexpensive enough for schools to buy without special grants and they will need to have the basic software already installed. When that day comes do you think we will be ready to welcome this new breed of word machines into our classrooms?

Look around you; the day is already here.

About the author

Tom Cecil is a Computer Repair Teacher working for the San Juan Unified School District near Sacramento, California. Students in his classes have built, tested and distributed over 800 computer systems to schools during the last 2 years. He also teaches computer assembly and repair workshops for teachers in his district.

Tom has been a full time teacher for just over 3 years. Presently working on a Masters in Technology Education and Curriculum Development, Tom's background as the MIS manager for a statewide wholesale distributor, and a freelance consultant, (out in the real world), give him a unique view of education's role in training the workforce of the future.