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Generation I

J. Alan Baumgarten

Looks like it's official. There's now a name for them: Generation I, or "Gen-I" if you're cool. This is the generation who grew up with the Internet.

The term was used in an article in the Wall Street Journal on March 12, part of a big section on e-learning called "Pass or Fail." The section included a variety of articles focusing on how the web is transforming education.

E-learning is apparently growing much faster than analysts predicted. (Isn't it funny that when analysts are dead wrong, they still get quoted? And it's a good thing?) The article quoted a lot of numbers. The online market for K-12 (US) is expected to grow to \$6.9 billion by 2003. 72% of two year and four year colleges now offer online courses. K-12 and higher education anticipate annual growth rates of over 50%.

But this is the stat that got me the most excited: nearly 30% of Motorola's employee training will take place this year on the Web. Let me fill in the blanks. Companies now want their employees to be able to get additional company training on the web. And the demand for employees who can learn online will only increase as more companies turn to web-based training.

Learning on the web is different than surfing the web—the Disney game site just doesn't cut it for kids. We need to be focused now on teaching methods and pedagogies that support web-based learning if we expect our graduates to be prepared for lifelong learning—and corporate training—online.

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Curriculum Standard

- [TEKS: 113.33](#)
World History Studies

(7) The student understands the impact of political and economic imperialism throughout history.

The Rise and Fall of Empires

Lisa Kerscher

Getting the population of a state or city to cooperate and make decisions can be pretty difficult; everybody has their own ideas of what's important and how they would like to live their lives. Even if only a few leaders are responsible for creating policies, getting them all to agree and then persuading the public to abide by the rules can be a challenging endeavor.

So imagine what it might be like for a government to manage a population spread over thousands of square miles of land, with each region consisting of a different sub-culture than the next. That's exactly what the leaders of empires have had to face.

By examining the rise and fall of these notable empires, students can learn a lot about the history and geography of a region, and also about the kinds of issues all governments grapple with.

First ask students *why* empires might be created. Is it because one person wants the ego trip of having power over many? What about economic factors, like controlling the use of natural resources? Write down students' ideas to refer to during the following activities.

The Roman Empire

The Roman Empire is probably the strongest example of an empire. Over the course of about 1000 years, it spread over Europe, into northern Africa and a bit into the Middle East. Have students in small cooperative groups visit the [Illustrated History of the Roman Empire](#) site and visit the [interactive map](#) of the empire. Using the menu on the left, students can see the empire's shifting borders at eight different



points in time. They should print each map, if possible, or you can provide them with copies.

Ask them to go back to the home page and check out the pre-empiric history by viewing the chapter on [The Kings](#) and [The Republic](#). This will help them understand how changes evolved in governing styles.

Next, ask them to focus on the chapters about the [Early Emperors](#), the [Decline](#), and the [Collapse](#). Have a member of each group explore a different section and note the highlights of each era. Who was in charge? What did the leader or group of leaders do while in power? How long did that form of government exist? What events occurred that changed the way the region was governed?

The Russian Empire

A modern example of an empire is the Russian Empire, a region that included the country of Russia and what are now mostly independent republics. Like other empires, it had a relatively long history of rulers, known as the tsars and tsarinas (sometimes also spelled "czars" and "czarinas").

To get an overview of Russian history, ask students to read the Annenberg/CPB Exhibit on [Russia's Early History](#). Then have small groups of students or the whole class review the timeline of Russian history from 800-2000 AD at PBS's [The Face of Russia](#). (A [text-only version](#) is available that can be easily printed.) Ask each student to note when each tsar or tsarina reigned, beginning in the mid-1400s. When completed, ask students to choose a different figure to research thoroughly, and then ask them to role-play the characters.



The new socialist government assumed control of what had been built by the tsars—a large country containing a variety of sub-cultures and landscapes, which became known as the United Soviet Socialist Republic (USSR). So, like the former regime, the new one was faced with the challenge of managing

and distributing the country's natural resources and balancing the economy, especially since it was imbalance that inspired the Bolshevik Revolution and eliminated the tsar.

Have students in small groups go to the Annenberg/CPB Exhibit's [Interactive Atlas](#) section and click [Maps](#). Ask students to view the maps showing the Oil Deposits and Political Changes. If possible, print out both maps for students to compare, or recreate both on a single map. Then ask students to write an essay about how they think the distribution of oil affected the government's efforts to keep the Soviet Union whole.



Extension Activity

As an extension activity, have students begin at the Russia exhibit's [home page](#) and explore the other sections to find out how and why the USSR splintered into its modern state. Why do students think the Republics fought for sovereignty? What was at issue? Why wouldn't they want to be part of a larger nation?

Reference:

Illustrated History of the Roman Empire
<http://www.roman-empire.net>

Annenberg/CPB Exhibits – Russia
<http://www.learner.org/exhibits/russia/index.html>

PBS – The Face of Russia
<http://www.pbs.org/weta/faceofrussia/timeline-index.html>

9 Months

J. Alan Baumgarten

The study of human fetal development reveals one of the most fascinating scientific stories to emerge in the late twentieth century. Until that time relatively little was known about fetal development. But through the development of miniaturization came cameras that could allow us to peer into this before unseen world of dramatic growth.

It is important for students to learn and understand the processes that occur during the nine months of human fetal development, and to understand the enormous commitment a couple must make when choosing to conceive a child. These are all topics few students know enough about.

The curricular standard for the study of fetal development officially falls under Health, but it has relevance in the sciences—specifically biology—and other content areas.

The study of fetal development need not become a pro-choice vs. right-to-life political debate, but be prepared as many of the issues surrounding that debate emerge during the course of study. If you choose to take it on, be advised that maintaining an objective stance will allow you to better moderate the student discussion (while not offending parents).

First 9 Months

I'm going to start you off with the absolute best resource on the Web for introducing students to the first nine months of an unborn child's life. The site is called [First 9 Months](http://www.parentsplace.com/first9months/), hosted by [ParentsPlace.com](http://www.parentsplace.com/). This is an award-winning multimedia site, but it requires browsers that are Flash and Java compatible. Check it on your school systems before sending students there.



The presentation outlines the life of Emma Katherine Moore, who was born on January 19, 1999. The story is written as a

Curriculum Standard

- [TEKS: 115.32](#)
Health

(3-A) Health Information.
The student explains fetal development from conception through pregnancy and birth.

first-person narrative as told by the father. The story is engaging, but hardly unscientific, with words like “pronuclei” and “zona” thrown in.

Instruct students to view the whole presentation by clicking past the intro and then clicking the right arrow. Navigation in the form of numbers (representing days, weeks, and months), but students should only use these for returning to a specific place. First timers should only use the right arrow to advance.

I appreciate how the presentation weaves the story of the parents into the process, without losing focus on the infant. Pregnancy certainly has a profound effect on the physiology of the mother, which should not be overlooked in studying this topic.

Before introducing students to this site, ask them to share (in writing or discussion) their experiences with relatives who have given birth—perhaps a mother, sister or other relative. What do they know about the process? Make note of inaccuracies in their responses so you can clarify them during the course of study.

After students visit the site, ask them to respond in writing. What did they learn that they did not really understand before? How did they respond to the personal tone of the presentation? Are there any points they would like to know more about?

Pregnancy Week-by-Week

For a less personal overview fetal development, try StorkNet’s [Week-By-Week Guide to Your Pregnancy](#). The site has a developmental summary for each of the 40 weeks of pregnancy, as well as maternal information and graphics (little detail).

One way to use this site is to assign each student to learn about development during a particular week (some may volunteer to take two). Back in class, ask students to explain how the baby has developed by the time of their assigned week.



Another option is to write a list of questions for 5-10 different weeks in the development process (e.g., in what week are all five senses fully functional). With students in the Internet lab, read each question and challenge students to find that week. This could be done as a speed challenge, or a good end-of-unit assessment.

If you would like to try a similar site with better graphics and diagrams, try BabyCenter's [Fetal Development](#) page. Click More Information below each month to see the diagrams.

Embryology

If your advanced students are ready for a challenge and have a strong biology background, take them to [BERP](#), the University of Pennsylvania's Basic Embryology Review Program.

At the time of writing, the [Overview](#) section is the only one available for public viewing. But this is a pretty intense overview with good graphics and a challenging text filled with medical terms. The second sentence reads, "The male and female pronuclei have come together to form the single, diploid (2n) nucleus of the zygote."

So there.

The graphics on the left are interactive; if students mouse over them little question-mark callouts appear. Click a callout and it will highlight the term on the right.

Developmental Photos

If you are looking for a series of fantastic fetal developmental photos, take your students to the Westside Pregnancy Resource Center's [Fetal Development Overview](#). The site credits as its source the book **Introduction to Child Development**, 6th ed. by John Dworetzky.



At the bottom of the first page, have your students click the link [Go to 1st Trimester COLOR PHOTOS](#). Read the introduction and scroll down the weeks. Once again, there is good information to read at each week (a little less technical), but the pictures really make this site. Students can click any picture to see a larger view. Let students continue like this through each trimester, taking notes and charting development along the way. Use any of the same activities mentioned before with this great resource.



Reference:

ParentsPlace.com – First 9 Months

<http://www.parentsplace.com/first9months/>

StorkNet – Week-By-Week Guide to Your Pregnancy

<http://www.pregnancyguideonline.com/>

BabyCenter – Fetal Development

<http://www.babycenter.com/fetaldevelopment/>

BERP

<http://www.med.upenn.edu/meded/public/berp/>

WPRC – Fetal Development Overview

<http://www.w-cpc.org/fetal.html>

Trees

Geri Ruane

Name _____

The diversity of tree species in the United States and throughout the world is incredible. We're going to explore the world of trees in this month's Internet Challenge. Let's learn fascinating facts about trees and see how they enrich our lives.

Consider this thought about trees, "They are beautiful in their peace; they are wise in their silence. They will stand after we are gone. They teach us and we tend them." – G. A. MacDunelmor

Let's zoom over to our web site for this month's challenge, [The National Arbor Day Foundation](http://www.arborday.org/) at www.arborday.org/.

In the green navigational bar on the left, scroll down the page and click [Youth Education](#) under Programs.

When the next page opens, click [Life of the Forest](#) under Kids. Scroll down the page and read. Then answer these questions:

1. As stewards of the earth's trees, it's helpful for us to know about the growth processes of trees, their role in the forest world, and how we can improve their quality.

From other clues in this sentence, what do you think steward means?

- a. guardian or keeper
- b. opponent?

2. Where does all of a tree trunk's growth take place?
 - a. It takes place in the leaves.
 - b. It occurs in the cambium, which is a thin layer of living cells that surrounds the wood.

Scroll back up the page. Click the graphic of the tree ring, [The Living Forest](#). Let's see what tree rings can tell us about the life of a tree.

3. How is the growth of wood different in the spring than from in the summer?
4. What does a black scar to the tree's ring represent?
5. Name three problems a tree encounters during its lifetime.
 - a.
 - b.
 - c.

Scroll up the page and click [A Seed Takes Root](#). Read the pictorial timeline that shows how a pinecone sheds a seed and becomes a tree.

6. The leaves emerge from the shell and create a supply of chlorophyll.

Which word means the same as emerge?

- a. evaporate
- b. appear

**Scroll up the page and click [Anatomy of a Tree](#).
Read about the different layers of a tree.**

7. Name the six parts of a tree:

- a.
- b.
- c.
- d.
- e.
- f.

8. What is the purpose of the outer bark?

9. Which part of the tree is as strong as steel?

- a. heartwood
- b. sapwood

10. How does water get moved through the tree to its leaves?

- a. Water goes through the tree's sapwood.
- b. Water goes through the tree's outer bark.

11. How do the lobes, leaflets and jagged edges of a broad leaf support the tree?

As you search through this site you will read many memorable quotations about trees. Identify the name of the person who said the following:

12. "I never before knew the full value of trees. Under them I breakfast, dine, write, read, and receive my company."

13. "Each generation takes the earth as trustees. We ought to bequeath to posterity as many forests and orchards as we have exhausted and consumed."

14. "The clearest way into the universe is through a forest wilderness."

15. "No shade tree? Blame not the sun but yourself."

16. "In the woods we return to reason and faith."

17. "Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it's the only thing it ever has."

18. "To live as a nation, to prosper as a state, and to live as people, we must have trees."

Scroll up to the top of any page you are on and click [Arbor Day](#). Read about Arbor Day and how it began.

19. How many years ago was the first Arbor Day celebrated?

20. National Arbor Day is celebrated each year on the last Friday in April. But many states observe Arbor Day on different dates according to their best tree-planting times. When does your state commemorate this day?

Good answers!

Extension Activities:

Choose one or complete them all.

Extension Activity #1:

Go to [Teaching Youth About Trees](#) at www.arborday.org/programs/TeachingYouth.html.

Scroll down the page until you see "Posters." Click on each title and look at the posters. Design your own poster about trees. What would the title of your poster be?

Extension Activity #2:

We know that trees can be affected by stress. They suffer from thirst, malnutrition, abuse and diseases, just like humans. What can we do to help protect trees from injuries, diseases, enemies and other sources of stress? How can kids volunteer to help?

Extension Activity #3:

Looking back at questions #12-18, which quotation was your favorite? Why? Explain in your own words the meaning behind this famous quotation.

Extension Activity #4:

Go to back to the National Arbor Day Foundation home page at www.arborday.org/ and [vote](#) for America's National Tree! Which tree would make the best symbol for America? Do you think America should have its own national tree? Why or why not? Share your ideas. With your teacher's supervision, click the links that will help you and your classmates decide upon your favorite tree. Remember: vote before Friday, April 27, 2001. On that day, the final results of this vote will be announced.

Extension Activity #5:

Are you interested in learning about trees in various parts of our country and in different countries? Here are a few web sites to get you started.

- [The Wonderful World of Trees](http://www.domtar.com/arbre/english/start.htm) at www.domtar.com/arbre/english/start.htm.
- [Tree Guide](http://www.treeguide.com/) at www.treeguide.com/. (Click trees of States and Provinces.)
- [A to Z of Trees](http://edu.leeds.ac.uk/~edu/technology/epb97/forest/aztrees.htm) at <http://edu.leeds.ac.uk/~edu/technology/epb97/forest/aztrees.htm>
- [What Tree Is It?](http://www.oplin.lib.oh.us/products/tree/) at www.oplin.lib.oh.us/products/tree/

Terrific! You've done a great job completing this Internet Challenge™. We've only begun to explore the world of trees. Next time you look at a tree, imagine it could tell you about its life. What a tremendous story it would be!

Answers to April's Internet Challenge

1. (a)
2. (b)
3. The wood formed in spring grows fast and is lighter because it contains larger cells. The growth of wood is slower in the summer; the wood has smaller cells and is darker.
4. The tree was exposed to a fire, but was only scarred.
5. To name a few problems are fire, drought, lack of sunlight, infestation from insects, and overcrowding from other trees.
6. (b)
7. The six parts are the outer bark, the inner bark, cambium cell layer, sapwood, heartwood, and the leaves.
8. The outer bark protects the tree from the outside world. It helps keep out moisture in the rain and prevents the tree from losing moisture when the air is dry. It also insulates it against cold and heat and wards off insect enemies.
9. (a)
10. (a)
11. They help evaporate the water used in food building, reduce wind resistance and even provide "drip tips" to shed rain that, left standing, could decay the leaf.
12. Thomas Jefferson
13. J. Sterling Morton
14. John Muir
15. Chinese proverb
16. Ralph Waldo Emerson
17. Margaret Mead
18. Theodore Roosevelt
19. 129 years ago (2001-1872)
20. Students' own answers.

Extension Activities

21. Students' own artwork.
22. Students' answers will vary.
23. Answers will vary.
24. Students' own ideas.
25. Students will look at various sites and discuss their findings.

Curriculum Standard

- [TEKS: 111.16](#)
Mathematics

(4.14) Underlying processes and mathematical tools. The student applies mathematics to solve problems connected to everyday experiences and activities.

Money Matters

Elisha Dillon

Adults know that money doesn't grow on trees—well, most of them—but children sometimes believe adults have a vast reserve of money that they can just dip into anytime. Students need experiences at home and at school that teach the value of money.

History of Money

Countries around the world have their own currency. Learn about [Foreign Currency](#) on this colorful web site created by a collector of paper money from around the world. Scroll down to the [Travelin' Money Index](#) and have pairs of students view monies from a wide variety of countries. Click the Page 1 – Page 10 links. Compare and contrast the paper bills from other countries to the bills with which your students are familiar.

The bills pictured on this site are of different denominations. Older students can click the [Currency Conversion](#) link under the heading, **How Much is that in Real Money?** This page explains how money converts when you travel to a foreign country.

For a history of American money, your students can visit the [U.S. Mint for Kids](#). Click the [Cartoons](#) link on the left and then the [animated version](#) of the online storybook—look for the link in the middle of the page). Here students will learn from an interactive Flash storybook that fully explains the process of creating a coin in the United States. Follow up with questions for your class. Where does this process start? Where are the four mints in the United States? Why do armored cars bring money to banks around the country?



The scenes depicted on American money show scenes from American history. The [Time Machine](#) link lets kids visually experience this history divided into eleven sections. Have groups of students choose an era and report to the class what they learned about that time period.

How much?

Ask the class if anyone has ever really wanted something, but just didn't have enough money. Chances are, you will get a unanimous "Yes!" Discuss these situations and then explain that many families have a budget, or a system that helps them save and spend money wisely.

Let kids put budgets into action as they [Build a Better Robot](#) at First Union's web site. This may be an individual or competitive group activity in which the game gives students \$5,000 to build the robot of their dreams. The only problem is that the parts with the most attractive features are very expensive. Students must decide what is most important to them, appearance or function. If the builder has money left over at the end, they receive a 'bonus' prize. What did students learn about money from this activity of money? How does this relate to everyday life?



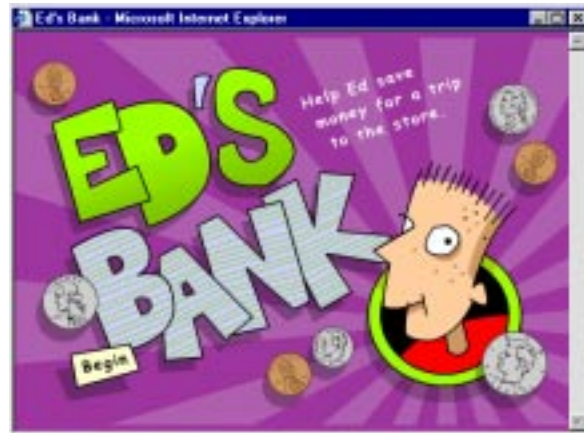
Kids will experience the value of saving money when they visit [The Calculator Game](#), another featured activity on the First Union site. Before the class participates in this activity, assign students to think of the item they most want to buy for themselves or for someone else. They need to have a parent or guardian help them write down answers to the following statements: The cost of what the child wants to buy, how much he or she has already saved, how much money he or she earns (allowance or other ways), how often he or she gets paid. The student also needs to write down the date by which the item is needed. Remind students that finances are personal so they should not be discussed among classmates.

You will help students enter the information on the calculator to see how much money needs to be saved per week for that item. If students get discouraged because they think they will never be able to afford that special item, give them some

encouragement to discover new ways to earn money so they can hopefully reach their goal. This is a real-life lesson; money can be used in many ways. Do your students spend all their money or try to always save some? Discuss why saving money is so important.

Show me the money!

For some fun you can let younger students play [Cash Puzzler](#) on Visa's [Family Fun](#) page. This puzzle lets kids put bills of different denominations back together in correct position. Older students can play [Ed's Bank](#). Students will help Ed save money within a certain amount of time. He then goes to the store to make purchases. But if Ed doesn't have enough money for the item he really wants, your students help him go back and earn more money.



These activities will provide your class with opportunities to appreciate the value of money. May this investment with your students provide many great returns.

Reference:

Foreign Currency

<http://www.ease.com/~randyj/money1.htm>

Oanda Currency Converter

<http://www.oanda.com/converter/classic>

U.S. Mint for Kids

<http://www.usmint.gov/kids/>

Build a Better Robot

http://www.firstunion.com/kids/capkids_robot.html

The Calculator Game

http://www.firstunion.com/kids/capkids_calculator.html

Visa – Family Fun

<http://visa.edgate.com/visa/english/resources/familyfun.html>

Curriculum Standard

• [TEKS: 112.43](#)
Biology

(7) The student knows the theory of biological evolution.

Tracing the Origins of Man

J. Alan Baumgarten

For the past 20 years most scientists have agreed that *Australopithecus afarensis*, represented by the famous Lucy skeleton found in Ethiopia, is the direct ancestor of the many branches of hominids—upright walking, human-like primates—including modern man.

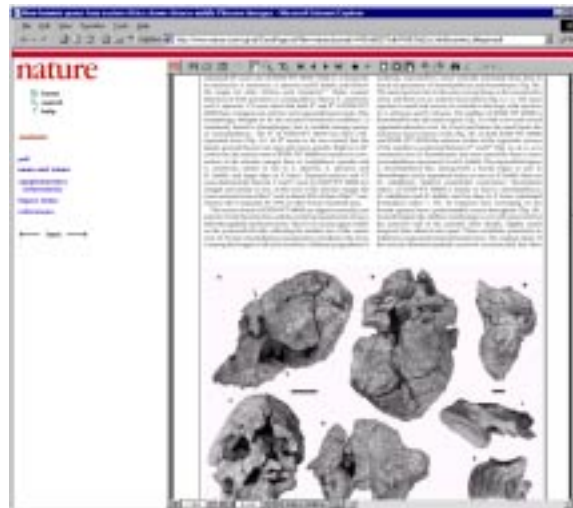
But a 3.5 million-year-old skull recently found in Kenya belongs to a completely different and previous unknown creature. Researchers have named it *Kenyanthropus platyops*, which is Greek for "flat-faced man of Kenya."

The skull has a bewildering mixture of physical features -- a flat, human-looking face, small brain and small teeth. This shows that *Kenyanthropus* had a much different diet than Lucy's species. The two could even have lived side by side.

According to paleontologists, modern humans can't be directly related to both, casting sudden confusion over what scientists know about early humans. It could even add a whole new main trunk to the human family tree.

The findings are published in the March 22, 2001 issue of [Nature](#).

In this lesson you will examine age-old fossils and learn about hominids—man's primitive ancestors. Keep in mind that in view of these new findings, some of what you find may already be a little out-of-date . . . but no more so than your textbooks.



Hominid Evolution

To understand the significance of the flat-faced man of Kenya, you need to understand what scientists have long believed about the evolutionary tree of man. A good introduction can be found at the [Hunterian Museum and Art Gallery](#) at the University of Glasgow, Scotland.

Now for the fun. Click any skull on the chart. When the new page opens you will find a graphic with two skulls (on the right is a modern human), and some text explaining what you are seeing.

To move the skulls around, click and drag your mouse up and down or left and right. What does the size tell you? Which hominid skull is most like a modern human?



Reference:

Nature Highlights – “Archaeology: The human family expands”

<http://www.nature.com/nature/links/010322/010322-1.html>

Huntarian Museum – Guided Tour of Hominid Evolution

<http://www.hunterian.gla.ac.uk/guided/Hominid/>

WSU – Species Timeline

http://www.wsu.edu:8001/vwsu/gened/learn-modules/top_longfor/timeline/timeline.html

American Museum of Natural History – Fossil Skulls!

<http://www.amnh.org/enews/iskulls.html>

District Technology Planning

Part 2 - The Planning Steps

Raymond Jaksa, MS

The following is the continuation of a three part series on Technology Planning. Part I addressed the type of committees every district needs to successfully create a comprehensive plan based on the needs of students, teachers, and community. In Part II, the planning process guidelines are outlined to facilitate an effective district technology planning process. In general, the steps in the planning process are as follows:

- Decision to begin to plan
- Orientation and public information awareness
- Assessment of current technology program status and learner needs
- Identification of curriculum initiatives
- Design of a technology-supported learning environment
- Development of implementation plan and budget
- Monitoring, evaluation, and revision of the plan

District Plan Approval

Before a district technology plan is submitted to the Superintendent and School Board, it is important to perform an internal audit and review. Individuals with primary responsibility for plan implementation (e.g., staff development coordinator, curriculum director, media and technology personnel, maintenance supervisor, finance officer) will conduct the review.

Plan Components

To achieve maximum effectiveness, the technology plan must be a collaborative educational and community effort. The minimum components of a comprehensive, long-range, district technology plan must include the following from both teams:

- vision statement
- broad goals
- objectives
- initiatives/strategies and related timelines
- expected results in the areas of teaching and learning
- monitoring and evaluation of the goals and objectives of the plan
- financial considerations and budget projections

The following is a description of the possible content for each of the required components:

Vision Statement

The vision statement of the technology plan will be consistent with the state technology plan. It must be broad in scope and a dynamic document that reflects the continuous growth of the school supported by the effective use of technology to improve student learning.

Broad Goals

Broad goals form the framework of the planning process and the implementation of the technology plan. They must align with other educational goals within the system and be realistic for the near future by acknowledging the constraints of priorities, costs, and other barriers. The goals of the technology plan must set a direction and reflect the following for the school system:

- Curriculum, instruction, and student performance needs
- Equitable access to appropriate technology applications
- Ongoing staff development programs
- Community and parental interactions
- Collaboration with business/industry, social service agencies, higher education, etc.

Objectives

Each objective will be observable, measurable, and define the necessary action steps for achieving each goal. The objectives will set priorities, focus on specific instructional programs, and include all functions necessary to implement and support the program.

Initiatives/Strategies and Related Timelines

Initiatives/strategies and related timelines comprise the action steps for each objective. Curriculum and instruction will be the major focus of the technology plan. Strategies will address the following areas:

- Curriculum/instruction
- Technology acquisition
- Staff development
- Staffing requirements
- Funding implications
- Data management coordination
- Inventory/maintenance/repair
- Facility renovation
- Required technology-related policy and procedures

After sign-off by these key individuals, the next step involves presenting the technology plan to the Superintendent so that the educational leader in the district can address any issues or questions before submitting the completed plan for the school board's review and approval. An essential issue to consider is quality assurance to determine how well the completed technology plan addresses school and curriculum improvement objectives and complies with the guidelines and standards. Next month, part 3 will address the remaining plan components, starting with The Expected Results.

Preventing Keyboard Injuries

Karl Barksdale

For Jenny, Miguel, and Mandy the pains of carpal tunnel syndrome came early. (Their names have been changed to protect their privacy.) For this trio, RSI symptoms began in their elementary typing classes. By the time they reached a required seventh grade keyboarding class their pains were getting worse. For Jenny, ten minutes of warm-up practice on the keyboard would cause pain for up to three hours afterwards. One worried mother refused to sign the course disclosure agreement for keyboarding writing the following comment on the back of the form:

"The reason this is late is because I have refused to sign it. It is no fault of Miguel. I am not signing away my right to hold the school responsible if he gets carpal tunnel."

Public awareness and parental attitudes are changing when it comes to these long-term repetitive motion nerve disorders. Miguel's mother suffers with carpal tunnel syndrome. She has seen the early warning signs in her son and wants him to avoid long-term problems.

Lini S. Kadaba of Knight Ridder News Service on February 11, 2001 reported:

"In a 1999 survey, 170 sixth-graders at an Andover, Mass., middle school complained of neck pain (35 percent), lower backaches (20 percent), sore wrists (17 percent), sore shoulders (17 percent) and sore elbows (10 percent)."

Moreover, a survey published last fall of Harvard University undergraduates showed that 40 percent reported symptoms of RSI.

The Urgency of the Situation

Cases of repetitive motion disorders among young people are on the rise. One athletic trainer with extensive physical therapy experience related that half of his previous physical therapy cases were related to keyboarding injuries. He stated:

"The hand was not made for this type of repetitive motion. The hand was made for grasping, not long durational, repetitive activities such as typing. Hands and wrists simply were not built to work in that way. Typing overworks the fine motor muscles and connective tissues.

"If students begin typing when they're eighteen or nineteen, symptoms normally occur about ten or fifteen years later. If a child begins typing in elementary school, many of them can expect problems in their early 20's. The more typing they do, the greater the risk."

OSHA Takes a Stand

An estimated 25 percent of all active keyboard and mouse users will suffer some form of repetitive stress injury during their lifetime. This injury rate is much too high.

And, OSHA agrees!

According to an AP report (Workers To Get Job-Injury Protection, Kansas City Star, Kalpana Srinivasan, 11/13/00), employees working at computers are among 100 million Americans receiving newly approved protections from job-related injuries. About six million workplaces are covered by new OSHA safety rules. Businesses will have until October 2001 to comply.

OSHA reports that 1.8 million workers have ergonomic related injuries. Annually, over 600,000 employees miss some work as a result. Moreover, the article states that "using a keyboard or mouse for more than four hours a day" is a risk factor. OSHA hopes to prevent 460,000 injuries annually with its new rulings.

Rethinking Teacher Training

State Vocational Education systems are not standing back idly waiting for this epidemic to get worse. According to Speaking Solutions Inc., thousands of schools across the country have embraced speech recognition as the next computer interface.

Twenty-one states have already adopted statewide Business Education teacher retraining programs using speech recognition technology. Over 317 teacher trainers have already been trained in those states with another 400 scheduled to be trained by the end of summer 2001. (Visit www.speakingsolutions.com/training.)

The Wrist Rescue and Recovery Challenge

In 1997, Speaking Solutions launched a campaign to prevent injury by reducing typing by 50% for all keyboard users. According to their recommendations, those experiencing stiffness, numbness, pain, or other discomfort should discontinue typing at least 90% of the time by substituting speech recognition, handwriting recognition, and other technologies that will reduce repetitive typing and clicking.

In 2000, Speaking Solutions issued a challenge to every Business Education and Computer Education instructor to identify three students with early symptoms of carpal tunnel, tendonitis, or other repetitive motion disorders each semester. The afflicted students should then be introduced to speech and handwriting recognition.

May is 50% Hands Free Month

Starting this May, another national challenge has been issued to make May "50% Hands Free Month." Teachers and students are asked to do as much computer work as they can without touching the keyboard or the mouse.

Hands free computing represents a strange new paradigm for most people, but with a little practice, 50% hands-free computer use is easy to accomplish and very practical for tasks such as report writing, email and web browsing, or using spreadsheets.

For the most at-risk, near total hands-free computing may be the only option they have to avoid long-term debilitating injuries. Learning how to use a computer without touching the keyboard or the mouse is a challenge, but it can be accomplished with less than three weeks of training and practice under the guidance of a trained instructor.

Speech Recognition Products

Teachers are currently learning to teach one of three major speech recognition products. Each of these products can produce dictation speeds of 110-160 words per minute with 95-98% accuracy with just a few hours of practice:

- L&H Dragon NaturallySpeaking (www.dragonsys.com)
- L&H Voice Xpress (www.lhsl.com)
- IBM ViaVoice (www.ibm.com/speech)

The new Microsoft Office XP Speech Recognition software is also about to hit the market. Microsoft's entry into the speech market will definitely help in the battle to reduce mouse clicking and keyboarding to safer levels.
