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Integrating Technology into Pedagogical Practice

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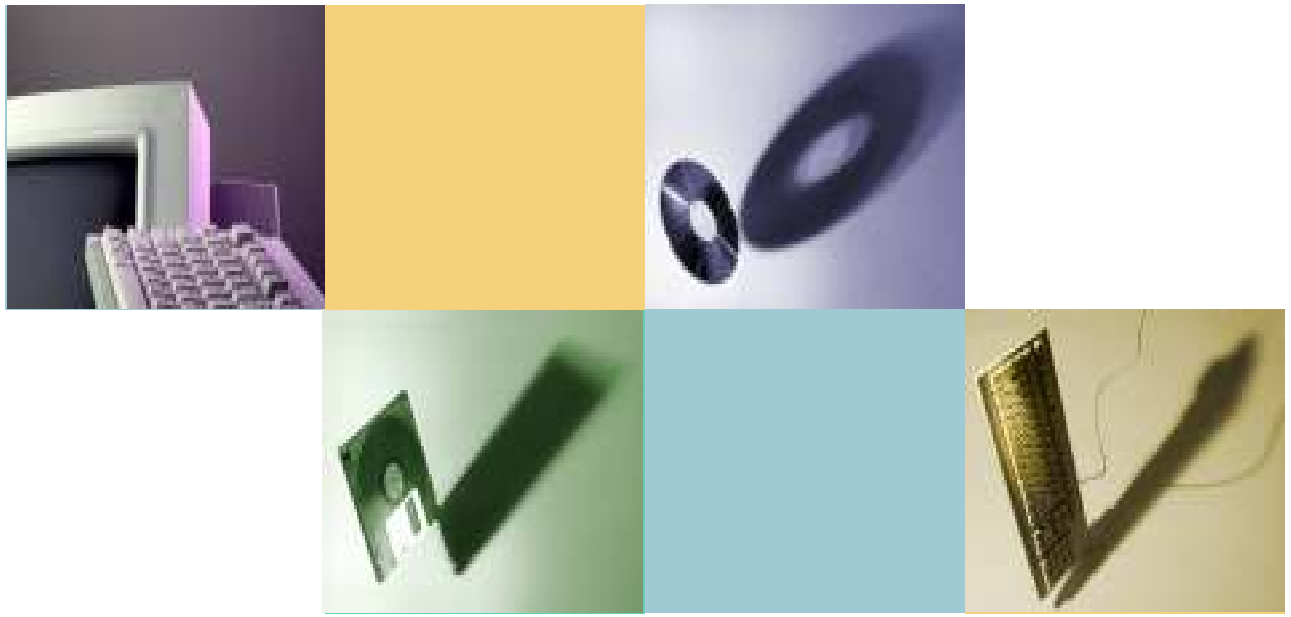
Integrating Technology into Pedagogical Practice



A Presentation Made to the

Association of Christian Schools International (ACSI) Washington, DC Educator's Convention

By Randall Dunn.

November 19, 2007

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Integrating Technology into Pedagogical Practice

BACKGROUND DISCUSSIONS

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reasons to consider technology use

- Motivation
  - Gaining learner attention
  - Engaging the learner through production work
  - Increasing perceptions of control
- Unique instructional capabilities
  - Linking learners to information resources
  - Helping learners visualize problems and solutions
  - Tracking learner progress
  - Linking learners to learning tools

reasons to consider technology use

- Support for new instructional approaches
  - Cooperative learning
  - Shared intelligence
  - Problem solving and higher-level skills
- Increased teacher productivity
  - Freeing time to work with students by helping with production and record-keeping tasks
  - Providing more accurate information more quickly
  - Allowing teachers to produce better-looking, more “student friendly” materials more quickly

reasons to consider technology use

- Required skills for the information age
  - Technology literacy
  - Information literacy
  - Visual literacy

ISTE Standards for Teachers

- TECHNOLOGY OPERATIONS AND CONCEPTS
  - Teachers demonstrate a *sound understanding of technology operations and concepts*.
- PLANNING AND DESIGNING LEARNING ENVIRONMENTS AND EXPERIENCES
  - Teachers *plan and design effective learning environments* and experiences supported by technology.
- TEACHING, LEARNING, AND THE CURRICULUM
  - Teachers *implement curriculum plans that include methods and strategies for applying technology* to maximize student learning.
- ASSESSMENT AND EVALUATION
  - Teachers *apply technology to facilitate a variety of effective assessment and evaluation* strategies.
- PRODUCTIVITY AND PROFESSIONAL PRACTICE
  - Teachers *use technology to enhance their productivity and professional practice*
- SOCIAL, ETHICAL, LEGAL, AND HUMAN ISSUES
  - Teachers *understand the social, ethical, legal, and human issues* surrounding the use of technology in PK–12 schools and apply that understanding in practice.

http://www.iste.org/Template.cfm?Section=NETS&Template=/ContentManagement/ContentDisplay.cfm&ContentID=4963

ISTE Standards for Students

- BASIC OPERATIONS AND CONCEPTS
  - Students *demonstrate a sound understanding of the nature and operation* of technology systems.
  - Students are *proficient in the use* of technology.
- SOCIAL, ETHICAL, AND HUMAN ISSUES
  - Students *understand the ethical, cultural, and societal issues* related to technology.
  - Students *practice responsible use of technology systems*, information, and software.
  - Students *develop positive attitudes toward technology* uses that support lifelong learning, collaboration, personal pursuits, and productivity.
- TECHNOLOGY PRODUCTIVITY TOOLS
  - Students *use technology tools to enhance learning, increase productivity, and promote creativity*.
  - Students *use productivity tools to collaborate* in constructing technology- enhanced models, prepare publications, and produce other creative works.
- TECHNOLOGY COMMUNICATIONS TOOLS
  - • Students *use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.*
  - • Students *use a variety of media and formats to communicate information and ideas* effectively to multiple audiences.
- TECHNOLOGY RESEARCH TOOLS
  - Students *use technology to locate, evaluate, and collect information* from a variety of sources.
  - Students *use technology tools to process data and report results*.
  - Students *evaluate and select new information resources and technological innovations* based on the appropriateness for specific tasks.
- TECHNOLOGY PROBLEM-SOLVING AND DECISION-MAKING TOOLS
  - Students *use technology resources for solving problems and making informed decisions*.
  - Students *employ technology in the development of strategies for solving problems in the real world.*

http://www.iste.org/Template.cfm?Section=NETS&Template=/ContentManagement/ContentDisplay.cfm&ContentID=4963

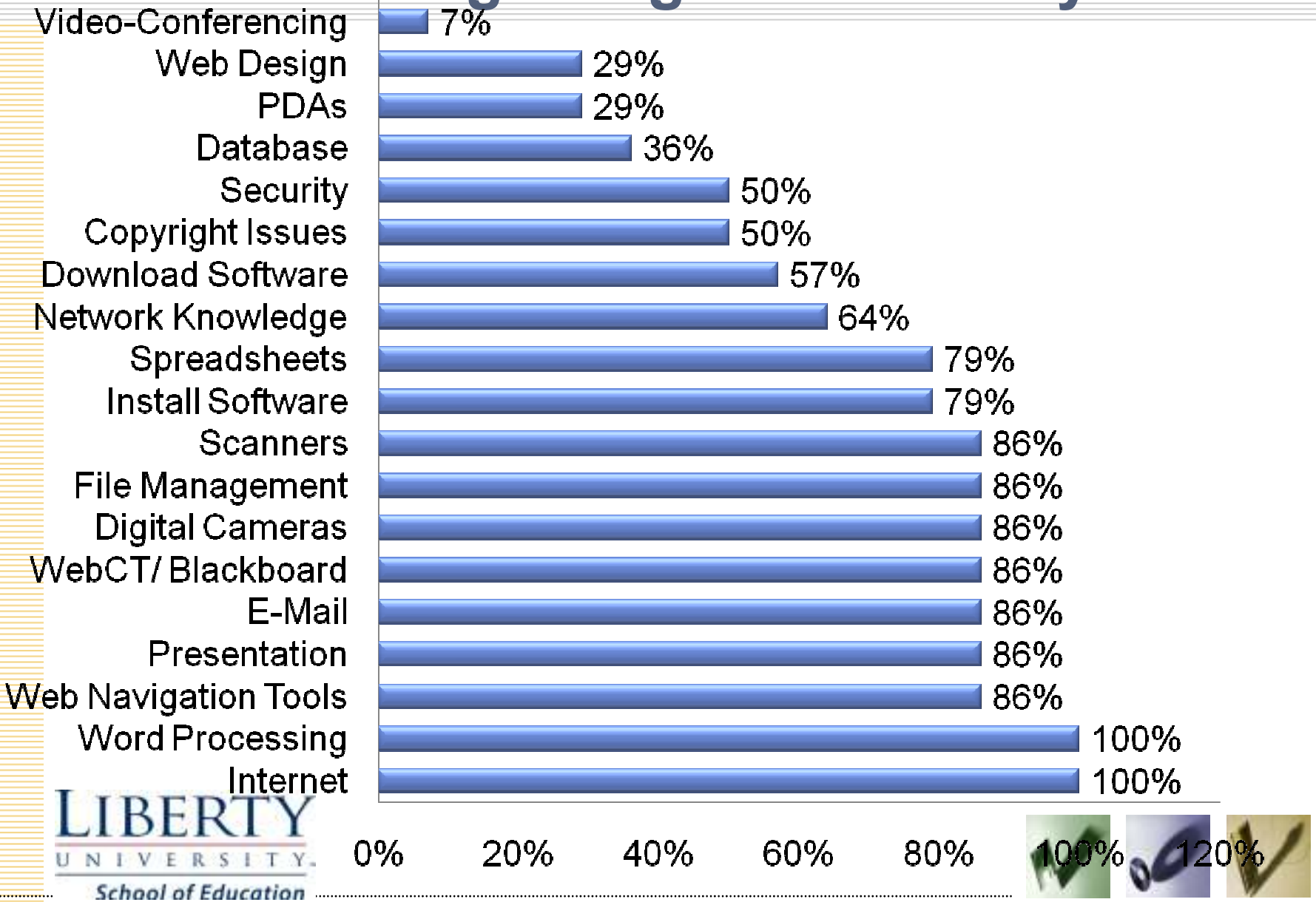
Basic Technology Skills Survey

- 100% Agree, I can
  - insert, format and eject a floppy disk/ compact disk (CD).
  - upload and download files from the Internet.
  - launch an application, create a document, use the copy/paste and cut/paste commands, change fonts: type, size, color and style, add clip art to documents, use numbering, bullets, and color in documents and use the spell checker.
  - create and manage files and file folders. I can move and rename those files and folders.
  - save files to different storage devices (e.g., floppy, hard drive, flash drive).
  - access network resources such as servers and printers.
  - open, close, resize and move windows.
  - search for and find a file using the computer's search function.
  - name, save, and delete files.
  - manage basic Windows/desktop commands such as open MY COMPUTER, empty the RECYCLE BIN, locate and use the START button and use the TASK BAR.

Basic Technology Skills Survey

- I know how the computer works in the primary four functions of input (keyboard, mouse and a CD-ROM reader), processing (CPU), storage (Zip cartridge, floppy disk, hard drive, superdisks, CD-ROM, etc.), and output (monitor, hard copy and soft copy). (92%)
- I can open the control panel and change the display settings. (92%)
- I can use search engines on the Internet to find personal and professional Web site information, including advanced search strategies (e.g., boolean searches). (92%)
- I know that there are two basic types of software (operating system software and application software). (92%)
- I can change the settings in the computer in the control panel such as date, time, font size, sound, monitor setting and other hardware settings (92%)
- I can use the basic features of Mozilla Firefox or MS Internet Explorer. (92%)
- I know basic computer terms such as: bit, byte, kilobyte, megabyte, gigabyte, terabyte, RAM, ROM and digital. (67%)
- I can determine the size of a file or folder. (58%)
- I understand file types (.doc, .dot, .txt, .rtf). (42%)

tech usage diagnostic survey



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technology expectations for teachers

- Level 1 > Technology Competency
- Level 2 > Professional Integration
- Level 3 > Pedagogical/ Learning Integration

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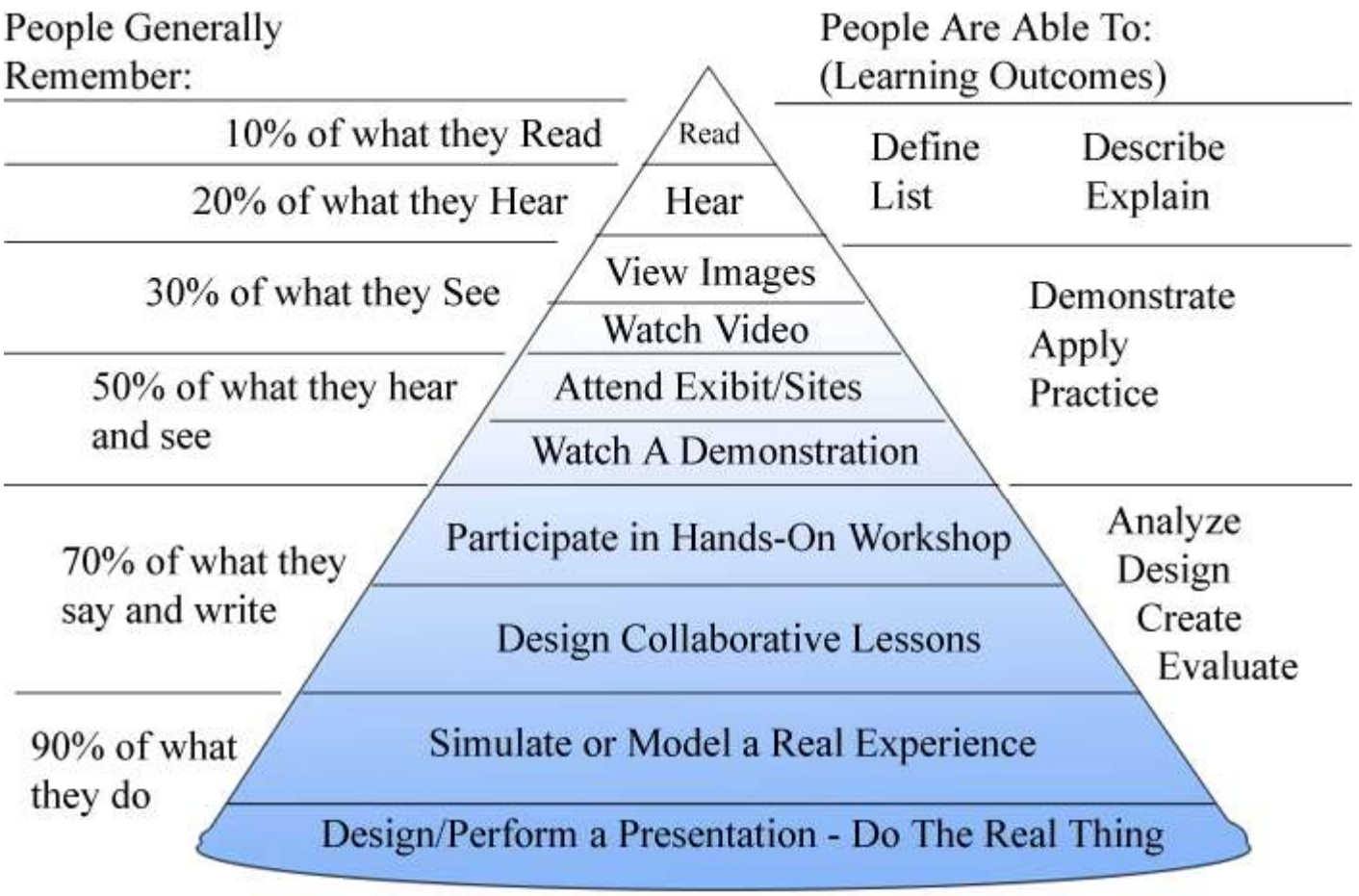
ASSURE Model

- Analyze Learners
- State Objectives
- Select Media and Materials
- Utilize Media and Materials
- Require Learner Participation
- Evaluate and Revise

Dale's Cone of Experience



Dale's Cone of Experience

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http://teacherworld.com/potdale.html

methods of instruction

Student-Directed

- Discussion
- Cooperative Learning
- Gaming
- Simulation
- Discovery
- Problem-Solving

Teacher-Directed

- Presentation
- Demonstration
- Drill-and-Practice
- Tutorial

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the missions of schools . . .

The first consideration in technology integration planning (on classroom levels and school/ system level)

Must always return to the mission (not bells-and-whistles)

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THE WEB

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knowledge

- HTML / HTM
- XML
- ASP.Net
- CGI
- FTP
- Javascript/ Applets
- Database
- Dynamic
- FTP

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design

What makes a horrible website?

- http://www.angelfire.com/super/badwebs/main.htm
- http://faculty.unlv.edu/blord/
- http://www.kli.org/
- http://www.pixyland.org/peterpan/
- http://www.shenandoahconnection.com/
- http://www.longscycle.com/
- http://web.archive.org/web/20040607092635/www.brown.edu/Divisions/Graduate_School/home/index.php

skills

- Planning skills (analyzing user, content, information architecture/ taxonomies, presentation)
- Web-Page Building (through WYSIWYG or straight code)
- Web Graphic Design (PhotoShop, etc - in JPEG and GIF)
- Through online tools – involves graphical planning, creative work
- Use of code for logic

software

- MS FrontPage/ Publisher
- NotePad
- MS Word
- Adobe GoLive/ Macromedia Dreamweaver
- Macromedia Flash
- Mac-specific
- Freeware/ Shareware/ Others (like HomeSite, Visual Studio)
- Web-based and site specific
- Blogging

professional use

- Class Site (information about course, for parents, for students, communication)
  - Calendar of assignments
  - Photos (protected?)
  - Assignments info
- Personal use
- Blogging for students, parents
- Collaboration with other educators for growth

pedagogical use

- Students creating a culminating activity bringing in multiple topics into an overall cohesive concept
  - Social Studies Research
  - Literary Study
  - Math Reports w/ Examples
- Portfolio presentation
- All class communication activities
- WebQuests

WebQuests

What is It?

http://webquest.org/

- A WebQuest is an inquiry-oriented activity in which some or all of the information that learners interact with comes from resources on the internet, optionally supplemented with videoconferencing. There are at least two levels of WebQuests that should be distinguished from one another.
  - **Short Term WebQuests -** knowledge acquisition and integration, described as Dimension 2 in Marzano's (1992) Dimensions of Thinking model. At the end of a short term WebQuest, a learner will have grappled with a significant amount of new information and made sense of it. A short-term WebQuest is designed to be completed in one to three class periods.
  - **Longer Term WebQuest -** what Marzano calls Dimension 3: extending and refining knowledge. After completing a longer term WebQuest, a learner would have analyzed a body of knowledge deeply, transformed it in some way, and demonstrated an understanding of the material by creating something that others can respond to, on-line or off-. A longer term WebQuest will typically take between one week and a month in a classroom setting.

Process

The Introduction

- Write a short paragraph here to introduce the webquest to the students. If there is a role or scenario involved (e.g., "You are a detective trying to identify the mysterious poet.") then here is where you'll set the stage. If there's no motivational intro like that, use this section to provide a short advance organizer or overview.

The Task

- Describe crisply and clearly what the end result of the learners' activities will be. The task could be a: series of questions that must be answered,
  - summary to be created,
  - problem to be solved,
  - position to be formulated and defended,
  - creative work, or
  - anything that requires the learners to process and transform the information they've gathered.

Resources

- Use this space to point out places on the internet (or physical resources in the classroom) that will be available for the learners to use to accomplish the task. Embed the anchors within a description of each resource so that your learners know in advance what they're clicking on.

The Process, Cont.

The Process

- To accomplish the task, what steps should the learners go through? Use the ordered list tag (ol) which will automatically number the steps in the procedure. Be sure to put a (li) before each item in the list, and close off the list with a (/ol). (Use angle brackets rather than parentheses).
  - This is step one.
  - This is the second step.
  - ... and so on.

Learning Advice

- Here you would provide some guidance on how to organize the information gathered. This advice could include suggestions to use flowcharts, summary tables, concept maps, or other organizing structures. The advice could also take the form of a checklist of questions to analyze the information with, or things to notice or think about.
- It's possible that the learning advice would flow best if merged in with the process description. If you're providing a lot of advice, or if the data gathering and analysis process has more than a few steps, it might be best to break Learning Advice out to a separate section.

Conclusion

- Put a couple of sentences here that summarize what they will have accomplished or learned by completing this webquest. You might also include some rhetorical questions that encourage them to extend their thinking into other content.

New and Improved . . Templates

- http://edweb.sdsu.edu/webquest/LessonTemplate.html
  - Frames
  - Non-Frames
  - Roll-overs (graphics)

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DIGITAL PHOTOGRAPHY

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digital photos

- Why pay $400 for Photoshop? Go Paint.NET . . .
  - www.getpaint.net (built on MS Paint platform with .NET Framework) OR
  - http://www.freeserifsoftware.com/ (Serif PhotoPlus) OR
  - http://www.gimp.com/windows (Gimp for Windows)

Pixels

- **Pixel** (picture element) - a single point in a graphic image. Each such information element is not really a dot, nor a square, but an abstract sample. With care, pixels in an image can be reproduced at any size without the appearance of visible dots or squares; but in many contexts, they are reproduced as dots or squares and can be visibly distinct when not fine enough. The intensity of each pixel is variable

Types

- Ultra compact digital cameras – good images; extremely lightweight; possibly less functions; moderate to expensive
- Compact digital cameras - compact, lightweight and easiest to use. Great for point-and-shoot photo-taking, offer plenty of scene modes. Some have semi-automatic and manual controls. All but the cheapest, offer very good image quality. Low to moderately priced, depending on features and number of megapixels.
- Advanced digital cameras - high quality lenses; advanced features can add converter lenses, filters, remote controls and external flashes. Some zoom models have image stabilization. Sometimes called *Prosumer*; moderate to high priced
- All-in-one digital camera with professional grade sensor - Sony Cypershot. It is the world's first all-in-one digital still camera that has a professional-grade, APS-class image sensor and gives a live preview while shooting. High priced.
- Digital Single Lens Reflex cameras –top-of-the-line. produce high resolution images; automatically but also have manual controls. High priced to very expensive, though the price is dropping for entry-level dslrs.

Good Choices

- Canon Digital Rebel series ($480-700)
- Nikon CoolPix ($180-500)
- Canon PowerShot ($180-500)

Memory Cards

- **Compact Flash (CF) cards** - widely available (up to 8GB) and are cheaper per megabyte than other standard media. Most advanced cameras now use CF. CF cards come in two varieties:
- **Secure Digital (SD)** - widely available in a wide range of sizes (up to 4GB); roughly equivalent in price to compact flash (CF). Multi Media Card (MMC) are similar to SD card from outside, but not compatible with SD cards.
- **Memory Stick (MS)** - used by most Sony cameras, and only by Sony Cameras. Most of MS cards are produced by Sony - rather high prices
- **Memory Stick|Memory Stick Duo (MS Duo)** MS variant which is smaller in size, and can be used with regular MS card cameras via adapter.

USB and FireWire

- USB - Universal Serial Bus (USB) - serial bus standard to interface devices; originally designed for computers, but its popularity has prompted it to also become commonplace on video game consoles, PDAs, portable DVD and media players, cellphones; and even devices such as televisions, home stereo equipment (e.g., digital audio players), car stereos and portable memory devices.
- FireWire - type of cabling technology for transferring data to and from digital devices at high speed. Some professional digital cameras and memory card readers connect to the computer over FireWire. FireWire card readers are typically faster than those that connect via USB. Also known as IEEE 1394, FireWire was invented by Apple Computer but is now commonly used with Windows-based PCs as well.

Software Choices

- Adobe Photoshop (or Adobe Photo Deluxe)
- Microsoft Paint
- Apple iPhoto
- MANY Others (Roxio, freeware)

Image Types – Definitions/ Background

- Lossy image types allow degradation, while lossless does not.
- Early monitors, video cards, etc displayed only 16 to 256 colors (thus pixelated). More recent, 16 million colors.

Image Types

- TIFF (Tagged Image File Format) – uncompressed and often lossless. Can be quite large. Often used with programs like PhotoShop and Illustrator.- not on web
- PNG (Portable Network Graphic) (more recent) – compresses but uncompresses exactly as it was (reversible) - supported by latest web browsers
- GIF (Graphical Interchange Format) – uses up to 256 colors (if image uses less than 256, then it renders exactly). It approximates fro colors outside of the 256. Uses unique compression technique for large uniform areas of color. – common on clip-art and general graphics on web, but will be replaced by PN
- JPG (Joint Photographic Experts Group) – Discards unimportant information from images, but maintains high quality. Users can adjust compression settings in software. – most common on web
- BMP (Bitmap File) – Microsoft uncompressed format. Not advisable to use, but often a result . . .
- PSD – PhotoShop format.
- PSP – Paint Shop Pro format

The Skinny

- You want to use JPG/ JPEG for the Internet (usually less than 50 kb/ 75 dpi is kind)
- You can use GIFs for the Internet, but for logos and such, not photographs
- You want to steer WAAAAAAY clear of BMPs
- Keep an eye out for what's new next week . . .

Digital Photo Professional Use

- In the context of web building, desktop publishing, presentation creation
- Simple size reduction, cutting out backgrounds, simple effects
- General desktop publishing tasks
- Web development and design
- Concept planning
- Creation of graphical materials (maps, flows)

Digital Photo Pedagogical Use?

- Assist in creation of montages
- Technology literacy
- Art/ creative expression
- Synthetical activities
- Image analysis
- Concept mapping (although the latest version of MS Office helps here . . .)
- Planning

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MULTIMEDIA

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MS PowerPoint

- Generally improving with versions
- Features include
  - Creating slides
  - Importing video, sound and photo
  - Managing slides through good interface
  - Automatic running of presentation (ie, timing, recording)
  - Linking
  - Writing CD Presentations
- PowerPoint Viewer available

HyperStudio 4

- Teachers “weave core curriculum content into technology-based learning activities.
  - support to manage project-based learning
  - the ability to foster collaborative learning
  - tools to create rubrics, portfolio pieces, and other assessment components “
- Brainstorming tools, visual organizers, project planners, desktop publishing features, and multimedia presentation capabilities

Packages

- **Apple Keynote** - current state of the art in this category; ease-of-use features; advanced support for multimedia, including scalable graphics; dual displays; priced affordably.
- **Astound Presentation** - highly-rated, powerful, and easy-to-use alternative to PowerPoint; can add multimedia effects to imported .PPT files that Microsoft's program can't produce; a one-click export to HTML or Dynamic HTML for plug-in-free web presentations.
- **Corel Presentations** – included in WordPerfect Office suite; features include templates, backgrounds, dynamic transitions, plus support for animation and sound within slides. Not only can it import and export PowerPoint files, it can also produce Flash files for publishing on the Web.

Packages

- **Lotus Freelance Graphics** - part of IBM's SmartSuite package; handles most presentation tasks (including reading .PPT files and exporting stand-alone executables) well enough to make PowerPoint unecessary for SmartSuite users; shares a similar interface to it's suite-mates
- **StarOffice/OpenOffice Impress** - most of the features you'd expect to find in a modern presentation package. It will run on Windows, Linux, or Sun Solaris (with an adaptation for Mac OS X also available) and stores its documents in XML, the fully-open data storage format. It has excellent compatibility with MS Office files.
- GoBe Productive - highly-integrated office software package, by some of the same people who created the legendary Claris/AppleWorks package. Rather than having separate programs for word processing, spreadsheets, graphics, presentation, etc. GoBe Productive is a single program that lets you do all of these things, even in a single document. It was a popular package for BeOS, and is now available for Windows. A trial version is available for download.

Packages

- **Prologue SundayPlus and Saguaro Studios Oratorio** - designed to assist churches with the use of multimedia technology in their worship services, and are easy for a novice to work with; dual-screen aspect, showing the presenter a comprehensive control panel and the congregation/audience just the presentation itself; SundayPlus is more powerful; Oratorio is less expensive. Both programs are available for Mac and Windows.
- **AppleWorks (previously known as ClarisWorks)** - lower-cost alternative to the more powerful presentation packages. It's an easy-to-use multipurpose program and graphics are one of its strong suits.

Presentation Professional Use

- Presentation/ direct instruction
- Organization/ portfolio
- In-services
- Parent Teacher Night
- In Lieu of Online WebQuests
- Use of notes and slide thumb view for assistance . . .

Presentation Pedagogical Use

- Portfolios
- Synthetical activities (timelines, biographies, presentations of learned content, alternative to the term paper)
- Encourages presentation skills, communication
- Need TV or projector (or just a few students hovered around screen)
- Remember Procedural and Substantive Assessment Practices . . .

Video

- Getting Less Expensive
- Use of Microsoft Movie Maker or iVideo (or proprietary software)
- Tip: Avoid the DVD writer video cameras . . .go with the hard drive based versions ($300-$800)
- USB 2.0 and Flash ports are often necessary

Video

- Some of the best culminating activities can be accomplished using video production (and DVD production!)
  - Planning and productions skills
  - Acting, music, communication
  - Technical skills
- Motivation is generally high so these can “run themselves”
- Specifics:
  - Newscasts through history
  - Play/ literary production
  - Documentary/ Interviews
  - “Virtual Tours”

Audio

- Simple Audio Management/ Editing Tools
  - Audacity (http://audacity.sourceforge.net/) –
    - Import many formats
    - Export many formats
    - Edit files, add effects, remove “noise”
    - Simple to use
  - iTunes
    - Manage files (podcasting and non)
    - Search for sound files
  - Macintosh uses GarageBand (among others)

Podcasting

- To create a podcast – Audacity/ lame encoder library (to create MP3)
  - See http://www.zefhemel.com/archives/2004/10/11/how-to-create-your-own-podcasting-show
- To create a podcast feed (RSS/ XML) - http://www.podcast411.com/howto_1.html
  - XML – *Extensible markup language* used to provide universal data access for podcast distribution
  - RSS – *Really Simple Syndication* used to provide XML for the taking (subscribing)

Podcasting

- To subscribe to podcasts – use Juice (http://juicereceiver.sourceforge.net/index.php - formerly iPodder), unless you are an Apple user then just use iTunes.
- Education Podcast Network (http://epnweb.org)

Professional

- Subscription to podcasts on a myriad of topics
- Recording classes for archiving or evaluation purposes
- For communication to parents

Pedagogical

- Record class discussions for struggling, absent, or even present students
- Recording for synthetical activity
- Record audio newsletter by students
- Creating class-based podcasts to be distributed

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WORD PROCESSING

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Word Processing

- Microsoft
  - Microsoft Word – now at Vista/ 2007 – older versions are cheaper but 2007/ Vista is about at $200 – first released in 1983
  - Microsoft Works – at 8.0 – replaced essentially by Word, at $50
  - Microsoft WordPad – on almost all Windows-based machines - 1995
- Sun
  - Sun StarOffice Writer - now at 8.0 –sits at $70-100 a license – 2000
  - OpenOffice Writer – free – 1994
- Corel
  - Corel WordPerfect X3 – an office suite – at about $140 - 1982
- Apple
  - AppleWorks 6 – an office suite – formerly ClarisWorks – at about $80 – first released in 1984

Professional

- Managing newsletters
- Parent and administrator communication management (templates, mail merges)
- Assessment creation and standardization (formatting, styles, templates)
- General professional use
- Digital lesson plan management (e-book of lessons, formatting styles, templates) – or MS Publisher

Pedagogical

- Working through the writing process, management of writing, organization
- Collaborative research projects
- Creation of content presentations (synthesis activities)
- Traditional reports, essays, etc
- Visual impairment flexibility
- General assistive technology functions, special needs accommodations
- E-assignment submission
- Future- break-down of the separate client application

Word-Processing Help

- http://office.microsoft.com/en-us/word/FX100649261033.aspx
- http://malektips.com/microsoft_word_2003_help_and_tips.html
- http://office.microsoft.com/en-us/word/HA011189521033.aspx
- http://office.microsoft.com/en-us/training/CR061958171033.aspx

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DATA ANALYSIS

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Spreadsheet > Professional Use

- Managing basic class data
- Managing grades (and reporting, averaging)
- Calendars
- Block Planning
- Numerous clerical tasks
- Calculations of all sorts
- Assessment

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Spreadsheet > Pedagogical Use?

- Simulations (for calculations in scenarios in science – weight on planets, eg)
- Recording and analyzing data
- Evaluating data for decision-making (creating own calculations for ratings); Estimation activities; Tally charts
- Displaying data in chart format – and experimenting with changing data - Pivots
- Spelling/Vocabulary lists
- Multiplication tables
- Probability and statistics

Some Resources

- http://www.sabine.k12.la.us/class/excel_resources.htm
- http://www.esu5.org/techteacher/excel.htm
- http://www.internet4classrooms.com/on-line_excel.htm
- http://jc-schools.net/tutorials/excel-activities.htm
- http://www.amphi.com/~psteffen/excel.html
- http://library.thinkquest.org/J0110054/Classroom_Activities.html
- http://www.west.asu.edu/achristie/CTC/spreadsheets.html

Database > Overall Functions

- Manage tables of data
- Can have multiple connected data tables
- Input data through user-designed forms
- Develop unique reports
- Integrate with MS Excel (and others)
- Query data for specialized questions
- Develop web-based access pages

Database > Professional Use

- Any sort of data management
- Development of data-delivery web applications (through FrontPage)
- General class record keeping
- General professional record keeping

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Database > Professional Use

- Class Site (information about course, for parents, for students, communication)
  - Calendar of assignments
  - Photos (protected?)
  - Assignments info
- Personal use
- Blogging for students, parents
- Collaboration with other educators for growth

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THE FUTURE

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Video-Conferencing

The future?

Applications for

- Classrooms at a distance
- Museums
- Access to experts
- LOC/ National Archives
- Future of Student Teaching . . .
- Connecting children to classrooms who otherwise can't

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Trends and the Future

- Document Management Systems (MS SharePoint, as an example)
- Virtual Reality (There and SecondLife)
- Integrated applications (network and client-isolated)
- Data-based web experiences (Web 3.0?)
- Educational gaming (commercial conversions, commercial releases, student-produced)
- Professional development communities
- Learning objects and online learning
- PDAs and One Laptops Per . .