SUCCESSFUL TEACHING AND LEARNING USING ELECTRONIC TECHNOLOGY …

Is primarily due to the instructional strategies used by the teacher, rather than certain characteristics of the technology. Electronic technology may be used well or poorly in instruction.

COLLECTING REAL TIME DATA

National Oceanographic & Atmospheric Administration – NOAA (www.noaa.gov)
- Sunspot positions – Example: Can calculate the rotational rate of the sun
- Tide data

Wheelock College Whale-Tracking (http://whale.wheelock.edu)
- Date and location for each sighting of a right whale named Rat.
- Ocean map for mapping data on Rat’s movements.
- A “distance generator” at a linked site determines how far apart the points are.

STUDENT EXPLORATION AND RESEARCH

Science and the Environment (www.voyagepub.com/publish/voyage.htm)
- Environmental news from all over the world, from over 500 magazines, journals, and newspapers
- Photographs, maps, graphics

National Aeronautics & Space Administration – NASA (http://www.nasa.gov)
SeaWiFS Project (http://seawifs.gsfc.nasa.gov/SEAWIFS.html)
- NASA Goddard Space Flight Center.
- Teacher’s guide with on-line activities (e.g., studying ocean color from space).
- Topics -- Life in the ocean, the ocean isn’t just blue, phytoplankton, the earth, carbon.

Exploratorium, San Francisco (http://www.exploratorium.edu/learning_studio/news/)
- Interactive science museum with on-line experiments.

INTERNET LABORATORIES
- The Cell and Photosynthesis (http://lenti.med.umn.edu/~mwd/cell_WWW/chapter1/cell_chapter1.html)
- Interactive Frog Dissection (http://curry.edschool.virginia.edu/go/frog/)
- Fetal Pig Dissection Page (http://hyperion.advanced.org/12014/links.html)
WEBQUESTS
Contain, at a bare minimum:
- **Introduction**
- A do-able and interesting **Task**
- **Set of Information Sources** necessary to complete the task
- **Description of the Process** the learners should go through in accomplishing the task
- Some **Guidance on How to Organize the Information** the learner will acquire
- **Conclusion**.

SCIENCE LESSONS, UNITS, AND LESSON ACTIVITIES
- Integrated, interactive curriculum unit that can be used by teachers, students, and parents.
- Cooperative lesson plans.

NASA and Science Applications International Cooperation (SAIC)
- At Athena Homepage ([http://athena.wednet.edu/](http://athena.wednet.edu/))
- A collection of on-line K-12 science lessons and instructional materials on oceans, earth resources, weather and atmosphere, and space and astronomy.
- **Example**: A lesson on hurricanes
- Elementary students will find it easy to follow the instructions.

GSFC Education K-8, NASA Goddard Space Center
- Variety of K-8 lessons and activities for space and earth sciences.
- **Examples**: Earth Observing System (EOS), Total Ozone Mapping (TOMS), Earth view, Living Ocean (teacher’s guide), global sea surface temperature, world cloud cover pattern, WIND laboratory, POLAR laboratory.

EdHelper.com ([http://www.edhelper.com/cat44.htm](http://www.edhelper.com/cat44.htm))
- Wide variety of lesson plans and lesson activities for science and math for all grade levels.
- Examples of the subjects of some environmental articles: a) global environmental change, b) how oceans influence climate, c) is the earth warming up yet?

SCIENCE RESOURCES
National Science Teachers Association ([http://www.nsta.org](http://www.nsta.org))
- On-line catalog of publications; links to state, national, and international science education organizations; two chat rooms for teachers on science education.
EVALUATING AND USING WEBSITES  (Carroll & Witherspoon, 2002)

“Not all information on the Internet is quality information, or appropriate for use with students. To monitor that information, teachers and parents must evaluate Websites for their appropriateness” (p. 33).

Content
  • Is the reading level appropriate for your students?
  • Is the type of information appropriate for your students?
  • Is the information comprehensive?
  • Is the information biased?
  • Does the information support your curriculum objectives?
  • Will the content address student outcomes?
  • Is the information accurate?
  • Is the information organized so that your students can use it?

Authenticity
  • What is the source of the information?
  • What is the date of the most recent update?
  • What is the intent of the authors?
  • Is the information objective or subjective, factual or opinion?
  • Can the facts be verified by another source? If not, what is the reason?
  • Is the author’s contact information available?
  • What citations are provided within the site?

Learning Strategies
  • What levels of learning are addressed?
  • Which of the multiple intelligences are addressed?
  • What is required of the students?
  • Does it require active or passive learning?
  • Will this site challenge your students appropriately?

Navigation
  • Is the page well organized? Could your students easily navigate the site?
  • Are there advertisements?
  • Are there pop-up windows? If so, are they appropriate?
  • What links are located in the site, and where do they take you?
  • Does it have a searchable index?
  • Are software plug-ins necessary to view the site?
  • Can you get around in the site quickly and efficiently?
  • How much time will students spend at this site?

Graphics
  • Are the graphics appropriate for your students?
  • Do the graphics add to or distract from the information?
  • Do the graphics delay the loading of the site?
Appeal
- Does it look good?
- Is there a good balance of graphics and information?

Availability
- Is the site readily available or frequently down?
- If the site has changed URLs, does the automatic roll-over to the new address occur? If not, is the new address entry given?

REFERENCES