Technology for the Classroom

TOOLS FOR TEACHING 21ST CENTURY LEARNERS IN MATHEMATICS

ONLINE TECHNOLOGY NEWS & JOURNALS

The Journal
www.thejournal.com

Tech & Learning
www.techlearning.com/

eSchool News
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CAST
Universal Design for Learning
http://www.cast.org/

University of South Florida
Psychological & Social Foundations
4202 E. Fowler Ave., EDU 105
Tampa, Florida 33620-5650
(813) 974-9472 (phone)
(813) 974-7647 (fax)
Website: http://floridarti.usf.edu/

Why use technology to learn?

Today's students are no longer the people our educational system was designed to teach (Prensky, 2001)

As the educational landscape continues to evolve, technology remains an Important catalyst for learning with 21st century students. Technology should be considered as both a tool for teaching and learning for both students AND teachers.

Advantages For Students...

- Virtually every school with access to computers has Internet access (99%) (NCES, 2005)

- Most teens believe that the Internet helps them do better in school

- 64% of online teens between the ages of 12 and 17 have created some type of content on the internet.

- Virtually all American teens play computer, console, or cell phone games

- When using the internet students are more likely to complete schoolwork and include up to date information in project (Levin & Arafah, 2002)

Advantages For teachers...

- Convenience

- Flexible schedule/ pace

- Networking

- Effective learning

- Increased interaction through discussion boards

- Level playing field/ anonymity

- Students in online classes learn "as well" or "better" than in a face-to-face class **(Kretovics & McCambridge, 2002)**

"You think of technology as a tool, we think of it as a foundation—it's at the basis of everything we do." (student panel on technology; Prensky, 2008)

What is Universal Design for Learning?

"Universal Design for Learning (UDL) provides a blueprint for creating flexible goals, methods, materials, and assessments that accommodate learner differences (CAST, 2009)."

UDL includes multiple means of...

Representation

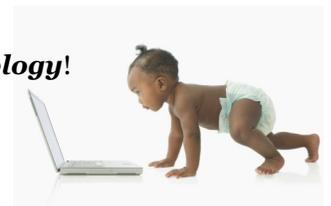...gives learners various ways of acquiring information and knowledge

Expression

...provides learners alternatives for demonstrating what they know

Engagement

...taps into learners' interests, challenges them appropriately, and motivates them to learn

All this can be accomplished though the incorporation of ***Technology***!

Using the Internet to Teach

21st century classrooms are vibrant, interactive, social places where teachers and students communicate, share information, and challenge each other's ideas. The Internet is an instrument that increases the resources available and decreases the time and location dependencies that can be limiting factors in classrooms. It offers powerful and varied ways for students and teachers to interact, manipulate data, and conduct research.

Top 4 reasons to use the Internet!

1.Expanded Resources

Because of the Internet, teachers are no longer limited to the resources found within their schools. Students can access information from the world's most reliable sources in just minutes!

2.Dynamic Resources

The range of resources available to students is staggering. Teachers are no longer limited to textbooks and film to enhance their teaching.

Students can now learn on a global level, even interacting with leading experts in a specific field.

3.Reduced Time and Location Dependency

The Internet allows students to access information anywhere and at any time.

4.Motivation

There is little argument to the motivational factors surrounding the use of the internet.

WEBSITES FOR THE CLASSROOM

The Global Schoolhouse
http://www.gsh.org/

Concept to Classroom
http://www.thirteen.org/edonline/concept2class/

Educational Wiki
http:// educational wikis.wikispaces.com/

Free Wiki for Educators
pbwiki.com

Free Blogger Site
www.blogger.com

Video in the classroom
www.needleworkspictures.com

Cable in the Classroom
www.ciconline.org/home

Wikis, Blogs, and Podcasts

Wikis

A **wiki** is a page designed to enable anyone who accesses it to contribute or modify content .

Classroom uses include:

- Class information
- Whole class and group projects
- Curriculum planning

Blogs

A **blog** is a Web site, with regular entries of commentary, or other material such as graphics or video.

Classroom uses include:

- Class Blog from teacher
- Journaling
- Digital Portfolios

Podcasts

A **podcast** is a series of audio files which are distributed over the Internet to portable media players.

Classroom uses include:

- Multiple ways of
- engagement
- Review of content at any time

Video

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While video viewing has been used in classrooms for some time, recent research has revealed that how video is used is important. While premade videos can enhance the content being taught, video production should also be considered as an educational tool.

"If people aren't being taught the language of sounds and images, shouldn't they be considered as illiterate as if they left college without being able to read or write?"
***-George Lucas***

Tips for using video :

- Develop goals for the video
- Use strategies: prediction, comprehension, and discussion
- Provide context for video
- Break into segments "clips"

Why use video production?

- Student engagement
- Student achievement
- Promote higher level thinking
- Encourage media literacy
- Incorporate principles of UDL

Virtual Math Manipulatives

Virtual Manipulative for Mathematics are interactive, Web or computer based visual representations of specific objects which represent mathematical concepts. Virtual manipulatives enable both students and teachers to explore abstract math concepts through the use of concrete manipulatives and build bridges between new information and prior knowledge.

Instructional–based (IT) manipulatives are an important supplement to hands-on "concrete" manipulatives often used in math education.

Research has suggested that students may develop a deeper understanding of math concepts when using virtual manipulatives (Moyer, Niezgoda, & Stanley, 2005)
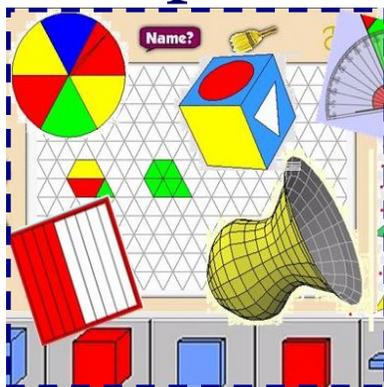
Popular virtual manipulative sites:

National Library of Virtual Manipulatives

http://nlvm.usu.edu/

Illuminations

http://illuminations.nctm.org/

Virtual Cuisenaire Rods

http://www.arcytech.org/java/ integers/integers.html

Visual fractions

http://www.visualfractions.com/

Math Practice

The Internet is flooded with various math websites. These sites range from interactive games to tutorial sites for those learning math. It is important for teachers to be able to discern which of these sites will provide their students with the most pedagogically sound mathematics practice and/or information.

Factors to consider when choosing math websites:

(Murray, Silver-Pacuilla, 2007)**:**

Are the directions clear?

Are there distracting elements on the screen?

Can the level of difficulty be adjusted?

What type of feedback is provided?

Are problems presented frequently enough to build fluency?

Is the site accessible for students with disabilities?

Popular math help sites:

Math is Fun

http://www.mathsisfun.com/

Ask Dr. math

http://mathforum.org/ dr.math/

The Math Forum

http://mathforum.org/ index.html

Assessment

Assessment is an integral part of the learning sequence, and progress monitoring is an important method of assessment in mathematics. Technology plays an increasing role in providing teachers with access to various progress monitoring probes for mathematics at all levels.

Progress monitoring...

- Is scientifically based
- Assesses student academic performance
- Evaluates effectiveness of instruction
- Is used with individuals or whole class

For more on progress monitoring and probes...

National Center on Student Progress Monitoring

http://www.studentprogress.org/default.asp

Intervention Central

http://www.interventioncentral.org/htmdocs/tools/ mathprobe/

Why Assistive Technology?

"The term assistive technology device means any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain or improve functional capabilities of children with disabilities." (20 U.S.C. §1401(a)(25)).

Depending on their needs, students with disabilities may use an assortment of assistive technologies and/or accommodations. Each person's individual needs will determine the technologies used. For example, if a student has difficulty with printed material, they may need a text reader or software

to enlarge the text. Students with fine and gross motor limitations may have a need for alternate keyboards or switch access to control a computer. (FDLRS-TECH, 2009)

Types of Assistive Technology

Text to Speech

Reading difficulties can adversely affect a students ability to solve math problems.

Tools (free or with free trial):

Read Please
http://www.readplease.com/

Text Aloud
http://www.nextup.com/

Accommodations

Free resource for teachers on accommodations.

http://www.paec.org/fdlrstech/acomedu.pdf

General

229 free assistive technology resources

www.onlineconferencingsystems.com/at.htm

Screen Magnifiers

Screen Magnifiers are generally used to enlarge the screen for those who are visually impaired.

Tools (free or with free trial):

Bigshot
http://www.bigshotmagnifier.com/

Dragnifier
http://www.magnifiers.org

Resources

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