Universal Design for E-Learning

Making Learning Accessible to ALL learners

Panaena Rue
Assistive Technology Consultant

"For people without disabilities, technology makes things convenient, for people with disabilities, it makes things possible."
(*The Inclusive Learning Exchange*, 2002)

Universal Design

A group of architects and engineers collaborated to create The Principles of Universal Design to reduce barriers in environments, communications and products making them accessible for individuals with disabilities, while enhancing access for all. They define Universal Design:

> Universal design is the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.
> **Ron Mace, The Center for Universal Design(Mace, 2004)**

One physical example is curb cuts; by making the sidewalk accessible for wheelchairs it also makes it easier for strollers, children's bikes and the elderly.

These principles can be applied to education through Universal Design for Learning (UDL). When teachers plan using UDL it benefits ALL

students and minimizes the need for modifications and adaptations for specific students.

When using electronic platforms to deliver learning materials UDL starts with choosing presentation software that support these principles and allow access and compatibility with assistive technology.

Universal Design for Learning

> Universal Design for Learning (UDL) provides a framework for individualizing learning through **flexible** pedagogy and tools. It challenges teachers to incorporate flexibility into instructional **methods** and **materials** as a way to accommodate **all students**. (*Universal Design for Learning*, 2004)

Universal Design for E-learning

The key features of universally designed curriculum are a range of methods for **accessing, using**, and **engaging** learning materials. These principles are applied to e-learning by:

- Choosing delivery software that is accessible or is compatible with assistive technology,
- Designing websites, PowerPoints and other digital materials to be accessible for ALL learners;
- Creating guidelines for on-line communities to include the use of person first language, for example, “people with disabilities” instead of “disabled people”.
- Conveying presentation information about materials in a manner that relates to ALL participants with singling out specific people. For example, expect that everyone participating will benefit from

descriptions of visual images – not just people with visual impairments.

Things to consider when designing e-learning curriculum:

- Is the set-up easy to navigate?
- Is the text easy to read, and accessible to a text or screen reader?
- Are pictures, graphics, charts, tables, graphics, and video available in multiple formats?
- Is information presented through audio also available in text formats?

Assistive Technology

> AssistiveTechnology (AT) includes both devices and services. A device is any item or piece of equipment used to maintain or improve the functional capabilities of a person with a disability. Many high-tech and low-tech devices are now available to assist people with disabilities with daily living tasks, communication, education, work, and recreation. (*What is Assistive Technology*, 2004)

Most Assistive technology (AT) used to access computer based trainings or classes will be on the individual user's personal computer. Listed here are AT software and hardware commonly used to access the computer. Most operating systems have some accessible features build into them including sticky keys (allows combination key commands to be entered one key at a time), the ability to change the contrast, color and size of font and to use the keyboard to control the mouse. The general public also uses many of these features and products.

Speech recognition software

Speech recognition software converts the spoken word into text. It can also be used to perform commands on the computer, for example “open file”.

Text readers or screen reader

A text reader converts text into speech. A screen reader converts everything on the screen including menus, and icons into speech. Inviduals with visual impairments or blindness, and individuals with learning disabilities commonly use this software. Some text readers can also convert the text into wave or MP3 files that can be stored then played back on a CD player or MP3 player.

Free or inexpensive text readers that you can use to test your text or use for yourself are available for download:

http://www.nextup.com/TextAloud/

http://readplease.com

http://www.cast.org/udl/index.cfm?i=211&option=Demo

Word Prediction and Abbreviation Expansion

Depending on the program, word prediction and abbreviation expansion software can be stand alone or allow the user to access other software (e.g., word processing software, web browsers). Word prediction works by generating a list of words based on the letters the user types, which the user then can select. Some programs also consider grammar when generating word selections.

Abbreviation expansion allows the user to encode words, which can then be retrieved using abbreviations.

For people with physical disabilities these programs required fewer keystrokes, while for people with learning and communication disabilities it expands their ability to generate writing. Both these programs are available for handheld devices.

Alternative Computer Access

Input Devices

Alternative input devices are any piece of software or equipment that used for a person to access the computer. Some of these include, alternative keyboards, Braille, mice, trackballs, touch screens, head pointers, eye gaze systems and communication devices.

Output Devices

Alternative output devices are ways that users receive information from the computer. Some of these include, text and screen readers, Braille printers, refreshable Braille, and real time captioning or sign language translation.

Resources for Learning about UDL and Designing Learning Environments Using UDL principles

Teaching Every Student in the Digital Age: Universal Design for Learning by David H. Rose & Anne Meyer (available for free download) http://www.cast.org/teachingeverystudent/ideas/tes/

UDL Toolkits http://www.cast.org/teachingeverystudent/tools/

Web Content Accessibility Guidelines http://www.w3.org/TR/WCAG10/

Designing Accessible Web Pages http://wata.org/resource/internet/design-for-web.htm

Papers from Adaptive Technology Resource Centre University of Toronto http://www.utoronto.ca/atrc/rd/library/library.html

Courseware Comparative Review

http://snow.utoronto.ca/initiatives/crseval/crseval.html and

http://snow.utoronto.ca/access/saga/index.html

EASI - Equal Access to Software & Information Online Clinics http://easi.cc/

Reference List

The Inclusive Learning Exchange. (2002). Retrieved January 12, 2004

Mace, R. (2004). *Principles for universal design*. Retrieved January 12, 2003, from http://www.design.ncsu.edu/cud/univ_design/princ_overview.htm

Universal Design for Learning. (2004). Retrieved January 12, 2004, from www.cast.org

What is Assistive Technology. (2004). Retrieved January 12, 2004, from http://wata.org/what-is-at.htm