Case Studies: Universal Design in Technology Education

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References

Article:

Book:
These Slides

• http://staff.washington.edu/tft
Ultimate goal:

To improve academic & career outcomes for all students, including those with disabilities
Presentation Outline

• Overview of universal design (UD)
• Three case studies:
  1. UD in postsecondary computing courses
  2. UD in K-12 education: Web design curriculum
  3. UD in technology: DO-IT Video
Ability on a Continuum

Not able

see
hear
walk
read print
write with pen or pencil
communicate verbally
tune out distraction
learn
manage physical/mental health

Able
Evolution of access approaches:

Exclusion
Rehabilitation & accommodation
Social justice & universal design
Approaches to access:

1. Accommodations
2. Universal design
Accommodation = Alternate format, service, &/or adjustment for a specific individual
“Coffeepot for Masochists”, Catalog of Unfindable Objects by Jacques Carelman; in Donald Norman’s *The Psychology of Everyday Things*, 1988
Universal design =

“the design of products & environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.”

The Center for Universal Design
www.design.ncsu.edu/cud
Inaccessible → Accommodation → UD
UD on a Continuum

All materials in printed form → Materials on website, some as PDFs → Materials on website, in a rich variety of accessible formats
Apply universal design to:

Student services
Technology
Physical spaces...
Instruction

Access Computing
UD of Instruction (UDI) is:

- an **attitude** that values diversity, equity, & inclusion.
- a **goal**.
- a **process**.
- **practices** that make learning products & environments **welcoming**, **accessible**, & **usable** for everyone.
Apply UDI to:

• Overall design of instruction

• Specific teaching techniques (e.g., lectures, large- & small-group discussions, video presentations, online instruction, case studies, role playing)

• Choice of course content (e.g., include UD/disability content)
A professor along with a total of 9 other staff & students met to discuss potential improvements to a chemistry curriculum. One participant requested a sign language interpreter. When the invoice arrived...
Who is right about the cost of interpreters?

a. Accountant: “Ouch. $80 for one person? That is expensive!”

b. Career Services Director: “Oh, no, the cost was only $8 per person.”
UD – know it when you see it:

...at “skateboard park”
Case Study #1

Universal Design in Education: Computing Courses
Examples of UD Applied in Computing Courses

Daniela Marghitu
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Access Computing

AASD-STEM
UD strategies employed include:

- accessible online portals for students & instructors [pca.eng.auburn.edu](http://pca.eng.auburn.edu/)

- Accessible educational technology including Altova XMLSpy [www.altova.com/xmlspy.html](http://www.altova.com/xmlspy.html)
UD strategies, continued:

– recordings of lectures
– a variety of instructional approaches
– course PowerPoint slides to be accessible to individuals with disabilities
– training for graduate teaching assistants to work with students with diverse abilities/backgrounds
Evidence of positive outcomes:

• Students with & without disabilities
  – report benefits from having course materials available online
  – praise features such as pre-tests that allow them to identify what knowledge & skills they need to gain
Evidence of positive outcomes:

• Two students with visual impairments
  – earned the highest possible grades in the COMP1000 Personal Computer Applications traditional course
  – expressed gratitude for making the course lab & instructional materials fully accessible to them
Evidence of positive outcomes:

- Another student with a visual impairment enrolled in the COMP1003 Personal Computer Applications Independent Learning course reported that she could complete all course requirements without accommodations from the disability services office.
Evidence of positive outcomes:

- Students with learning disabilities reported that they benefited from Web-based training that allowed them to:
  - work through instructional materials multiple times
  - successfully search for answers themselves instead of having to ask questions during class or office hours
Evidence of positive outcomes:

- Students who are deaf & those for whom English is a second language report benefits from transcripts of video and audio content.
Case Study #2

Universal Design in Education: Web Design Curriculum for K-12 Schools
Web Design & Development I
Course Curriculum

Module 3: Web Standards and Accessible Design

Overview
The purpose of this module is to assure that your web projects are accessible to all possible users. Computer users are incredibly diverse. They access the Web using a wide variety of browsers on different operating systems. They have different screen resolutions, font sizes, and color schemes. Many users access the Web on tablet computers with touch screens, or on mobile phones. Many users have disabilities and access the web with custom configurations or using assistive technologies. Web standards are the rules that govern how web pages are built so they work for all these different users. In this module you will learn about standard web coding languages, HTML and CSS, and will learn about the different versions of HTML that are available. You will also learn how web pages can erect barriers for users with disabilities if they aren't designed and coded properly, and will learn about accessibility standards that help you to create web pages that are fully accessible to everyone.

Lessons
- Lesson 1: Web Standards
- Lesson 2: How People with Disabilities Access the Web

http://uw.edu/accesscomputing/webd2
Features

• Teaches standards-based and accessible web design
• Is platform and vendor-neutral (teaches concepts, not specific tools)
• Accessible design is taught early as a core design principle, and reinforced throughout the course
• For assignments students must use valid code & conform to accessibility standards
Oh, and did I mention the cost?
Examples

• Students learn about the importance of good HTML structure for accessibility and Search Engine Optimization

• Students learn about content and structure first (HTML), *then* add presentation (CSS)

• When students learn about graphics, they learn about contrast, alt text, and using graphics wisely and effectively
More Examples

• Students learn about same-page links by creating "Skip to main content" links
• When students learn about CSS pseudo-class selectors, they learn to use :hover (for mouse) and :focus (for keyboard)
• Students learn to validate their code, and to check their pages for accessibility
• All assignments must validate and be accessible
Modeling Universal Design

• Assignments emphasize function, not products. We provide recommendations of multiple tools for performing that function, so students have a choice.

• We provide a variety of recommendations for instructors as to how student understanding can be assessed.
Modeling UD (continued)

- The curriculum is delivered via valid, accessible HTML5
- Video content (coming soon) will be captioned and audio described
Outcomes

- Over 3500 individuals worldwide have registered to access the Instructors' version
- Piloted in 200 classrooms in Fall 2012
- 371 teachers are subscribed to our webcourse support list
Impact

• All these teachers are learning about (and becoming champions of) standards-based accessible design

• All their students – the people who will be building our future world – are acquiring a respect for diversity and an understanding of universal design
Case Study #3

Universal Design of Technology: DO-IT Video
It all began with

<video src="itaccess.mp4">
</video>
supports accessibility

<video controls>
<source src="itaccess.mp4" type="video/mp4"/>
<source src="itaccess.webm" type="video/webm"/>
<track kind="captions" src="itaccess.vtt"/>
<track kind="descriptions" src="itaccess_desc.vtt"/>
</video>
IT Accessibility: What Campus Leaders Have to Say
Questions about browsers' native media players

• Do they support closed captions?
• Do they support description?
• Are they accessible with keyboard alone?
• Are they accessible using a screen reader?
• Are the buttons and controls large enough to see easily? Do they have ample contrast?
• Do they support high contrast color schemes?
We decided to build our own player
Features

• Support for closed captions
• Support for closed text-based description
• Support for recorded audio description
• Fully accessible player controls
• A fallback player (JW Player) that looks and behaves exactly like the main player
• Ability to search videos using their captions
• An interactive transcript (assembled using captions and description)
• Controllable with hot keys from anywhere on the page
• Customizable via Settings button
Video Search

Search the full text of DO-IT's video library:

aspirational policy

Matching captions from this video:

- 07:27 ...(Brady Deaton) It is very important that a university follows a policy and a process...
- 08:14 ...(Tracy Mitrano) A policy really is an important way to go...
- 08:27 ...The second thing I would say about policy is there are really two types in general....
- 08:33 ...One is a policy that you have because you have a law,...
- 08:35 ...for example the Family Education Rights Privacy Act policy,....
- 08:45 ...There's another kind of policy that I would call aspirational policy...
- 08:52 ...but you most certainly can err on the aspirational side....
- 08:56 ...An aspirational policy is something you establish for your institution....
Interactive Transcript

IT Accessibility: What Campus Leaders Have to Say

Return to main page for this video

Transcript

[Michael K. Young] We are committed to the notion that everyone should have an opportunity to participate in higher education whether it be from the learning perspective or the research perspective or an opportunity to work here at this institution. We benefit from that because we get to enjoy the talents and the skills of those people who come in, and also their perspective which in many cases will be different from the perspective of others on campus. So accessibility becomes a very important value at the university.

Words appear: Michael K. Young, President University of Washington. Images of a teacher and students in classrooms and at computer stations. Text moves on a Closed Circuit TV. Words appear: IT Accessibility: What Campus Leaders Have to Say. Tracy Mitrano, Director of IT Policy, Cornell University

[Tracy Mitrano] We’re a leading university globally. We want the best talent in the world for our students, our staff, and our faculty. And we
Customizable

IT Accessibility: What Campus Leaders Have to Say

Preferences

Saving your preferences requires cookies.

Modifier Keys

- Alt key
- Control key

Features

- Closed captions on by default
- Description on by default
- Use text-based description if available
- If using text-based description, make it visible
- Highlight transcript as video plays
- Keyboard-enable transcript

Save  Cancel

[Tracy Mitrano] We’re a leading university globally. We want the best talent in the world for our students, our staff, and our faculty. And we
Everyone benefits!
This includes people who:

- Are unable to hear the audio
- Are unable to see the video
- Are unable to use a mouse
- Don’t understand English
- Have slow Internet connections
- Need to find content quickly
More on DO-IT Video

• The website:
  – [http://uw.edu/doit/video](http://uw.edu/doit/video)

• The open source Universal Media Player (UMP):
  – Coming soon
  – Watch [http://terrillthompson.com/blog](http://terrillthompson.com/blog)
Online Resources

• These slides: 
  http://staff.washington.edu/tft