Innovative Distance Education: Accessibility and Usability Training

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Today’s Agenda

- Introductions
- So Many Terms…
- What We Know…
- Where Do We Start?
- What Does EIT Accessibility “Look” Like?
- Universal Design
- Universal Design for Learning
- Testing
- Q&A
Accommodations, Accessibility, and Assistive Technology

SO MANY TERMS...
## Accommodation vs. Accessibility

<table>
<thead>
<tr>
<th>Accommodation</th>
<th>Accessibility</th>
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<tbody>
<tr>
<td><strong>Students self disclose</strong> to receive academic accommodations in the classroom (e.g., notetaking support, extended time, real-time captioning, etc.)</td>
<td><strong>Course should be accessible out the box.</strong> Inclusive practices like universal design encourage flexibility and designing for all students, not the average student.</td>
</tr>
<tr>
<td><strong>Accommodations are provided on individual basis.</strong> In essence, the existing course is retrofitted to accommodate student with a disability.</td>
<td>Courses using online components (e.g., LMS), <strong>should meet web accessibility standards and guidelines</strong> (i.e., Sect. 508, WCAG 2.0 AA).</td>
</tr>
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</table>
Understanding Accommodations and AT

Assistive Technology (AT) can be an accommodation, but not always (e.g., extended time on tests).

Still imperative that the instructional resources implemented in the course are accessible to assistive technology users.
Types of Impairment and Assistive Technology

- **Sensory (Loss of vision and/or hearing)**
  - Screen readers and refreshable braille devices for people who are blind or have other print disabilities
  - Open or closed captioning for people who are deaf

- **Learning/Cognitive**
  - Organizations, readability

- **Physical**
  - Alternatives input tools, such as speech-to-text software, for people who cannot use a computer mouse
Trends in HE, Recent litigation, EIT ”In”-Accessibility

WHAT WE KNOW…
Trends in Higher Ed...

- Increasing numbers of students with disabilities entering IHE
- Greater implementation of online/e-learning technologies in higher education classrooms (online and F2F)
- Growth in distance education offerings by IHE
- Growing number of legal challenges/findings against IHE by individuals with sensory impairments (visual and/or hearing loss)
Recent Litigation…

<table>
<thead>
<tr>
<th>Institution</th>
<th>Year</th>
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<tbody>
<tr>
<td>UC-Berkeley (again)</td>
<td>2016</td>
</tr>
<tr>
<td>Miami (OH)</td>
<td>2016</td>
</tr>
<tr>
<td>CU-Boulder</td>
<td>2015</td>
</tr>
<tr>
<td>EdX</td>
<td>2015</td>
</tr>
<tr>
<td>Atlantic Cape CC</td>
<td>2015</td>
</tr>
<tr>
<td>Univ. of Phoenix</td>
<td>2015</td>
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<tr>
<td>Univ. of Cincinnati</td>
<td>2014</td>
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<tr>
<td>Univ. of Montana</td>
<td>2014</td>
</tr>
<tr>
<td>Youngstown State</td>
<td>2014</td>
</tr>
<tr>
<td>Maricopa CC</td>
<td>2014</td>
</tr>
<tr>
<td>Florida St. Univ.</td>
<td>2014</td>
</tr>
<tr>
<td>Louisiana Tech</td>
<td>2013</td>
</tr>
<tr>
<td>SCTCS</td>
<td>2013</td>
</tr>
<tr>
<td>UC-Berkeley</td>
<td>2013</td>
</tr>
<tr>
<td>Penn St</td>
<td>2011</td>
</tr>
<tr>
<td>Ohio St. Univ.</td>
<td>2010</td>
</tr>
</tbody>
</table>
How Does Everything Tie Together?

Accessible EIT

Assistive Technology

Accommodations

Accessible EIT

Equal Access for all students!
It doesn’t matter where you start your focus, it is a continuous cycle that constantly helps meet the needs of all students.
WHERE DO WE START? ....

Roles and Responsibilities, Challenges, Textbook Selection and Procurement
Roles and Responsibilities

Accessibility is a team effort!

- EIT accessibility staff assist with defining roles and responsibilities as it relates to accessibility.
  - E.g., EIT Accessibility Group, EITA Guidelines, Consistent Communication with Key Stakeholders, etc.

- Administrative support.
  - Defines requirements through policy and procedure.
  - Advance support of an Accessibility Plan.

- IT Professionals (Developers, Content Managers, Academic IT, etc.) need consistent communication to create accessible projects.
Roles and Responsibilities: How are you involved with accessibility?

- Do you use a Learning Management System (LMS)?
- Do you use websites in class or for posting information?
- Do you create or post documents or videos online for class?
- Do you use technology (i.e., wikis, etc.) for your class assignments?
- Do you use visuals or play audio/video in the classroom that give important info pertaining to the class?
- Do you use webinars, or other classroom capture or conference technology or record your class for review?
Roles and Responsibilities: How are you involved with accessibility?

- When overseeing or working on projects do you integrate accessibility into the planning process?
- Do you train your staff on accessibility so it comes from a top-down approach?
- Do you influence or decide on technology purchases, if so have you considered accessibility?
- Do you oversee computer classroom settings, is it accessible?
- Do you develop Policies, procedures or guidelines for you offices or employees? If so, have you included accessibility?
- When creating committees, have you included someone from the ATI office to help with accessibility?
Do you influence or decide on technology purchases?

Do you develop websites, applications or documents?

Do you oversee computer classroom settings?

Do you manage others who may work on the above mentioned?

Do you work in multimedia or telecommunications?

Do you use or help faculty use webinars, other classroom capture or conference technology?
If you answered “Yes” to any of these questions, you may be ..... 

- Posting, 
- Distributing, 
- Creating/Developing, 
- Using, 
- Maintaining...Inaccessible Information!

- What can you do to make it accessible?
Challenges around Procurement

- Complexity of procurement related workflows (how many different ways can something be purchased? *Library vs. Departmental Purchase vs University-wide Purchase*)
- Magnitude of purchase requests and authorized individuals to make purchases.
- Lack of awareness about accessibility and how it plays into procurement.
- Lack of resources for assessing accessibility of services and goods.
- Is it considering procuring an item if there is no cost? *Textbook selections ....*
Common Issues of Accessibility

- Inaccessible LMS’, University Wide Applications and teaching supplemental applications
- Alternative texts (textbooks)
- Document accessibility (Word, PPT, PDFs)
- Captioning for videos
- Inaccessible library resources (databases, search, print resources)
- Additional classroom resources (e.g., iClicker, podiums)
- Inaccessible university websites/web resources
- ATMs
- Access to auxiliary offices (financial aid, registrar)
But how do you know if your everyday technology meets accessibility standards or is working towards compliance?

You don’t unless you ask!
- Is there University Policy about accessibility? *Know your guidelines!*
- Do vendors have a VPAT?
- Did you search for accessibility on their website?
- Do vendors have a roadmap showing accessibility updates?
- Do vendors have testing documentation?
- How are other institutions checking for accessibility?
Teaching to enhance the students' perspective and serve them by providing the best education possible.

Similarities of Face-to-Face and Online Learning

- Students are the Focus
- Textbooks and Supplemental Content (3rd Party)
- LMS and content (videos, documents, library databases)
- Software, Websites and Applications
- Teaching to enhance the students' perspective and serve them by providing the best education possible.
Case Study Example

A course is wanting to use an online human anatomy application for supplemental teaching. The course is designed in HTML5, recently updated from flash. Has some accessibility built-in, but not enough for someone who may be using a screen reader. What can you do?

POLL QUESTION:

What do you do?

1. Don’t purchase the product
2. Ask the vendor to make the product accessible
3. Find an alternative teaching solution
4. All of the above
Potential Next Steps

You could try...

- Working with the vendor
- Testing the application
- Ask the vendor to agree to create a roadmap incorporating changes

- In the meantime, check to see if the images can be pulled directly from the application and added to a 3D printer.

- Work contract language into the purchase to ensure vendor is held to standard (include VPAT, Roadmap, Alternative Action plan, etc.).
Examples, Design Considerations, Identifying Accessible Resources

WHAT DOES EIT ACCESSIBILITY "LOOK" LIKE?
E.g., Accessible Documents

The Anatomy of an Accessible Page

Syllabus

- DL 101 - Introduction to Online Learning
- Course Information:
  - Course Title: Introduction to Online Learning
  - CRN: 12345
  - Credits: 3
  - Term: Winter 2014

Instructor Information:
Hello! My name is John Doe, and I'll be your instructor for this course. I've taught this course online for the past two years. Each time I teach it, I learn something new.

Assignments/Assessments:

Grading Scale

<table>
<thead>
<tr>
<th>Grade</th>
<th>Grading Scale by Points</th>
<th>Grading Scale by Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>202 - 225 +</td>
<td>90 - 100%</td>
</tr>
<tr>
<td>B</td>
<td>180 - 201</td>
<td>80 - 89%</td>
</tr>
<tr>
<td>C (or P)</td>
<td>157 - 179</td>
<td>70 - 79%</td>
</tr>
<tr>
<td>D</td>
<td>135 - 156</td>
<td>60 - 69%</td>
</tr>
<tr>
<td>F (or NP)</td>
<td>&lt; 134</td>
<td>&lt; 59%</td>
</tr>
</tbody>
</table>

Late Work & Make-up Policy
Assignments must be completed on time in order to earn full credit. (Late assignments will earn 50% credit.)

Special Accommodations:
Students who experience disability-related barriers should contact Disability Services (www.pcc.edu/disability). If students elect to use approved academic adjustments, they must provide in advance formal notification from Disability Services to the instructor.

DL 101 - Online Learning Best Practices

Best Practices when using complex graphics:

This graph summarizes the growth of students using home broadband the period from January 2004 to 2008. The percentage increased from 22% in 2004 to 48% in 2008.

When using complex images, include Alt text as you would for any other image but also include additional description as a caption. If more description is needed, include it in the content of the page.
E.g., Labeling Images

- Graphics should have meaningful labels:
  - Ex: “Photo of Secretary of Education Arne Duncan reading to children at Central Elementary School.”
  - Not: “Photo.jpg”

- The labels can be visible to everyone, or they can be hidden in the programming of the web page. Designer’s choice!
E.g., Accessible Forms

- E.g., Color Contrast
  - Meaningful information should be conveyed through more than just color.
  - For example, individuals unable to identify color would not know which fields were required. A simple fix would be to add an asterisk(*) next to the required fields.
E.g., Keyboard Navigation

- Users should be able to “tab” through an application and get to all information and functions.

- Pages should not require users to manipulate a mouse for navigation.
Designing for All in the Online Classroom

UNIVERSAL DESIGN...
Why Universal Design?

- Term borrowed from the movement in architecture and product development that calls for curb cuts, automatic doors, video captioning, speakerphones, and other features to accommodate a vast variety of users, including those with disabilities.

- Experience shows that all such flexible designs are less expensive and cumbersome than costly retrofits, and that, in fact, everyone benefits from universal design features (e.g., captions, curb cuts).
Think about your users...

<table>
<thead>
<tr>
<th>Feature</th>
<th>Permanent</th>
<th>Temporary</th>
<th>Situational</th>
</tr>
</thead>
<tbody>
<tr>
<td>Touch</td>
<td>One arm</td>
<td>Arm injury</td>
<td>New parent</td>
</tr>
<tr>
<td>See</td>
<td>Blind</td>
<td>Cataract</td>
<td>Distracted driver</td>
</tr>
<tr>
<td>Hear</td>
<td>Deaf</td>
<td>Ear infection</td>
<td>Bartender</td>
</tr>
<tr>
<td>Speak</td>
<td>Non-verbal</td>
<td>Laryngitis</td>
<td>Heavy accent</td>
</tr>
</tbody>
</table>
Example #1:  
*Curb Cuts/Automatic Doors*

<table>
<thead>
<tr>
<th>Sliding Glass Doors</th>
<th>Curb Cuts w/ Bumps</th>
</tr>
</thead>
</table>

![Diagram of Sliding Glass Doors with wheelchair user]  
![Diagram of Curb Cuts with bump]
Example #2:
Stairs/Ramps (GMU)

Front Entrance
(Aquia Building)

Ramp Access between
Aquia and SUB I
Example #3: Computers/Mobile Devices

Mac OS X
Web-based Tools – Library Databases (Full-text HTML, ReadSpeaker)

- Ability to translate text
- Downloadable mp3 file
- Built-in text-to-speech capability
- Text Highlighting
- Also available as separate PDF
Web-based Tools – *Films on Demand (Captions and Transcripts)*

![Image of Films on Demand interface]

- **Captions**
- **Interactive Transcript**
- **Searchable Video Content**
Accessible Video Player: OzPlayer

- All controls accessible via keyboard
- Accurate, synchronized Captions
- Synchronized audio description
- Interactive Video Transcript

"going to be this huge process and this complete throwaway of everything that they've done—because

remember, they're proud of the thing that they've created. You want to make sure that

you're helping them to make that thing better, not just calling their baby ugly."
Considerations for the online classroom

Universal Design for Learning
Key Points

- Current instructional approaches have common activities that create access barriers
- *Universal Design for Learning* (UDL) is one strategy to remove these barriers
- When implemented consciously these approaches improve the experience for students with disabilities

Image Credit: EcologyofEducation.net
About UDL

Universal Design for Learning Guidelines

**AFFECTIVE NETWORKS:**
THE WHY OF LEARNING

**Engagement**
For purposeful, motivated learners, stimulate interest and motivation for learning.

**RECOGNITION NETWORKS:**
THE WHAT OF LEARNING

**Representation**
For resourceful, knowledgeable learners, present information and content in different ways.

**STRATEGIC NETWORKS:**
THE HOW OF LEARNING

**Action & Expression**
For strategic, goal-directed learners, differentiate the ways that students can express what they know.

Image Credit: [http://www.cast.org/our-work/about-udl.html#WKKGgRIrKRs](http://www.cast.org/our-work/about-udl.html#WKKGgRIrKRs)
UDL vs. Instructional Approach

Question: Doesn’t UDL conflict with current approaches?

UDL
- Representation
- Engagement
- Action & Expression

Instructional Approach
- Active
- Blended
- Hybrid
- Fully Online
- Problem-based
- Project-Based
- Team-Based

Doesn’t UDL conflict with current approaches?
Multiple Means of Representation

Principle I examines how learners perceive and comprehend information. Whether by disability, culture, or preference, learners learn and make connections to educational content in many different ways.
E.g., Document Accessibility (Word)

- Alternative text to images, charts, graphs, and objects
- **Styles in long documents**
- Short titles in headings
- Hyperlink text that is meaningful
- Simple table structure
  - No blank cells for formatting
  - Specify column and row headers in tables
- Avoid use of repeated blank characters
- Avoid using floating objects
- Avoid using image watermarks
E.g., Using Styles in Long Docs (Word)

Heading 1
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Sed ut lacus ex, tempor et ligula vel, eleifend euismod ante. Ut euismod, velit vel, tempus bibendum, nunc nunc rutrum tellus, non commodo tellus nunc.

What is Cap and Trade?
Issues with Cap-and-Trade
American Clean Energy and Security Act of 2009
State-Level Opposition in USA
"Carbon Tax" - An Alternative?
Carbon Credit Trading is the New "Derivatives..."
E.g., Alternative text descriptions for complex images

**Description:**

The Krebs Cycle is depicted as a linear reaction which leads downward into a cyclical reaction. Here, the steps of the reactions are presented as lists.

1. **Linear Reaction**
   - Pyruvic acid, a 3-carbon compound.
   - One carbon molecule is lost as part of a CO2 molecule.
   - An NAD-positive molecule enters the reaction, then leaves as NADH.
   - A 2-carbon acetyl group remains.
   - Coenzyme A, or CoA, joins the 2-carbon acetyl group to form Acetyl-CoA.
   - CoA leaves the reaction as it delivers the acetyl group to the circular reaction.

2. **Circular Reaction**
   - The two-carbon acetyl group joins a four-carbon compound to form a 6-carbon compound, citric acid.
   - A carbon is lost as CO2.
   - NAD-positive enters, then leaves as NADH.
   - A 5-carbon compound remains.
   - Another carbon is lost as CO2.
   - NAD-positive comes in and leaves as NADH.
   - ADP comes in and leaves as ATP.
   - A four-carbon compound remains.
   - FAD comes in and leaves as FADH2.
   - NAD-positive comes in and leaves as NADH.
   - Back again at the top of the circular reaction, a two-carbon acetyl group from the linear reaction enters, forming the 6-carbon citric acid at the beginning of the cycle.
E.g., Document Accessibility (PPT)

- Add alt text to images, charts, graphs, and objects
- Ensure that all slides have unique titles
- Ensure that the reading order of each slide is logical
- Use hyperlink text that is meaningful
- Simple table structure
  - No blank cells for formatting
  - Specify column and row headers in tables
- Include closed captions or text transcripts for audio/video
- Increase visual contrast of slide content
E.g., Adding Captions to slides with audio (PPT)
E.g., STEM Content

- STEM can be particularly challenging
- Tactile graphics (more common), 3D printing (possible)
- Whenever possible:
  - Provide \textit{LaTex} or \textit{MathML} (do not use Equation Editor in Word)
  - Avoid handwritten content
Multiple Means of Action & Expression

Principle II examines how learners interact with the learning environment and express their comprehension of the educational content.
E.g., Assessments
Multiple Means of Engagement

Principle III focuses on the regulation of emotion to support cognition.

For that reason, it examines how learners are engaged or motivated to learn.
E.g., Group work, reflections, etc.

- Heighten interest and monitor progress by:
  - Engaging students with simple welcome emails/announcements
  - Have students run small group activities/discussions
  - Journals/Personal reflections after each class
  - Tie in real-life examples/activities/discussions
Baseline Design Considerations

Additional Considerations
Baseline Design Considerations for Accessible Electronic & IT Resources

■ **Visual:**
  ■ Provide descriptions for all meaningful graphics (images, charts, graphs, SmartArt, objects)
  ■ Provide descriptions for videos where visual content is important to understanding subject matter.
  ■ Use styles in long documents and on websites (i.e., heading tags)
  ■ Choose applications that support keyboard navigation and are compatible with screen readers

■ **Hearing:**
  ■ Provide captions all videos
  ■ Provide transcripts for audio only

■ **Cognitive, Neurological:**
  ■ Use consistent navigation, tab order, appropriate language level
Manual and Automated (Examples)

Testing for Accessibility & Usability
Microsoft Office Built-In Accessibility Checker

- Click Review Tab/Check Accessibility
- Accessibility Checker Rules: **Errors**, **Warnings**, and **Tips**
- Additional Info:
  - Rules used by the Accessibility Checker
CommonLook Office Professional

- Installs as plug-in for MS Word & PPT
- Walks user through creating an accessible PDF from Word or PPT doc.
Ally (Blackboard)

- Alternative accessible formats (checks and produces)
- Provides instructor feedback on accessibility considerations
- Institutional reporting
- Coming soon...
  - Brightspace, Moodle, Canvas support
UDOIT (Canvas)

- **Universal Design Online content Inspection Tool**

- Identifies “errors” and provides “suggestions”

- Checks for appropriate use of:
  - Headings
  - Alternative text for images
  - Table headers
  - Color contrast
  - Video captions

- Free/Open-source
Summary/Questions
Contact Us

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Phone: 513-529-9006
**Additional Resources**

- Free PDF checker, auto repair and wizard: [PAVE](#)
- Free PDF checker (Doesn’t require Adobe Pro): [Access for All PDF Accessibility Checker (PAC)](#)
- Free PDF checker (Does require Adobe Pro): [Commonlook PDF Validator](#)
- Free PDF to HTML tool, great for students use (Does require Adobe Pro): [Callas Software – pdfGoHTML](#)
- If you want to check websites a free resources that allows Section 508 or WCAG 2.0: [Achecker](#)
- Another web accessibility checker for those starting out in accessibility: [WAVE](#)
- Microsoft Office Built In tools: [Making Documents Accessible](#)

**Document Accessibility Toolbar:**
- Visit VisionAustralia.org
- In the search field: DAT
- The first link is for [Document Accessibility Toolbar](#).
- Follow the instructions on the page to download.

- [Portland Community College Accessibility Handbook](#)
- [Microsoft Office Accessibility Checker](#)
- [CommonLook Office Global Access](#)
- [UDOIT](#)
- [Blackboard Ally](#)