# AMATYC Conference 2017

## Session S128: Creating Accessible Digital Course Content

## Links to Resources:

Math Equations and Graphs

MathType: https://www.dessci.com/en/products/mathtype/

MathPlayer: https://www.dessci.com/en/products/mathplayer/

MathML: https://www.dessci.com/en/reference/webmath/tech/mathml.htm

Desmos: https://www.desmos.com/accessibility

LaTeX: https://www.latex-project.org/

Texas School for the Blind and Visually Impaired: http://www.tsbvi.edu/

General Accessibility Resources

University of Minnesota Accessibility U: http://accessibility.umn.edu/

Portland Community College – Accessibility for Online Course Content: https://www.pcc.edu/resources/instructional-support/access

Western Governor's University Accessibility Checklist: http://bit.ly/2rrg9yr

Accessibility: Designing and Teaching Courses For All Learners Self-Paced MOOC: http://bit.ly/2sMGyKx

Iowa State University Engineering-LAS Online Learning: https://www.elo.iastate.edu/resources/

Section 508 – Developing Accessible Instructional Course Content: https://www.section508.gov/content/build

Web Accessibility in Mind (WebAIM): http://webaim.org

WCAG 2.0 (Web Content Accessibility Guidelines): https://www.w3.org/TR/WCAG20/

JAWS (Job Access With Speech): http://www.freedomscientific.com/Products/Blindness/JAWS

Visually Impaired Monitors: http://store.humanware.com/hus/prodigi-duo-2-in-1-electronic-magnifier-24-in.html

Resources for Formatting in Microsoft Word and PowerPoint

Working with Styles in Microsoft Word: https://support.office.com/en-us/article/Apply-change-create-or-delete-a-style-1a2cead9-897f-48a7-9122-7849d3b5030a

Video Applying and Modifying Styles in Word 2016: https://www.youtube.com/watch?v=w2lES-5Ynbk

Using the Accessibility Checker: https://support.office.com/en-us/article/Use-the-Accessibility-Checker-on-your-Windows-desktop-to-find-accessibility-issues-a16f6de0-2f39-4a2b-8bd8-5ad801426c7f

WebAIM Color Contrast Checker: https://webaim.org/resources/contrastchecker/

## Resources for Captioning Videos

National Center on Disability and Access to Education – Captioning YouTube Videos: http://ncdae.org/resources/cheatsheets/youtube.php

Adding Your Own Subtitles and Closed Captions: https://support.google.com/youtube/answer/2734796?hl=en

How to Caption Someone Else's YouTube Video: http://www.3playmedia.com/2015/09/16/how-to-caption-someone-elses-youtube-video/

Amara (free subtitling): https://www.amara.org/en/about-amara/

National Association for the Deaf Described and Captioned Media Program: https://dcmp.org/

## Resources for Making Math Accessible

Wiris Editor: http://www.wiris.com/editor/demo/en/mathml-latex

Video of Tools for Creating Accessible Math: https://www.youtube.com/watch?v=1hrSK4HJ5d0

Math Accessibility at Portland Community College: https://www.youtube.com/watch?v=1hrSK4HJ5d0

Math & Science Accessibility Resources PCC: https://www.pcc.edu/resources/instructional-support/access/math.html

Accessible Math on the Web: https://www.youtube.com/watch?v=TairRxyy_Hs

Design Science Accessibility Resources for Mathematics: https://www.dessci.com/en/solutions/access/

Tools for Creating Accessible Math: https://www.youtube.com/watch?v=1hrSK4HJ5d0

Talking Calculator: https://education.ti.com/en/product-resources/special-needs

Raised Graph Paper: http://www.aph.org/products/

# Creating Accessible Digital Course Content

AMATYC Conference 2017
San Diego, CA
Session S128

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## Objectives

- Overview of Universal Design for Learning principles and accessibility standards along with their importance in digital course content.
- Present tools and resources available to make course content accessible.
- Encourage sharing of best practices and strategies.

**Disclaimer**: We are not accessibility experts!

# Laws Regarding Accessibility

- Section 504

  "no qualified individual with a disability in the United States shall be excluded from, denied the benefits of, or be subjected to discrimination under any program or activity that receives federal financial assistance."

- Section 508

  A 1998 amendment to the Rehabilitation Act (1973) that requires electronic and information technology developed, procured, maintained, or used by federal agencies to be accessible by people with disabilities.

# Universal Design for Learning

- From the Higher Education Opportunity Act of 2008
  a) provides flexibility in the ways information is presented, in the ways students respond or demonstrate knowledge and skills, and in the ways students are engaged; and
  b) Reduces barriers in instruction, provides appropriate accommodations, supports, and challenges, and maintains high achievement expectations for all students, including students with disabilities and students who are limited English proficient.

# Why Did We Become Interested in Accessibility?

- Lori's story of working with a visually impaired student in a Trigonometry class
- The illusion of accessible content availability
  - JAWS Reading a Math Page Example
  - Trigonometric Identities for Screen Readers

    $$\sin^2\theta + \cos^2\theta = 1$$

    "Sine squared of theta plus cosine squared of theta equals one."
  - Example of a Hands on Graph
- Physical resources for Accessibility

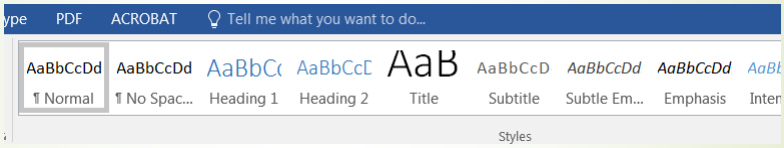
# Digital Content

- Microsoft Word
- Microsoft PowerPoint
- Learning Management Systems
- Audio/Video

# Microsoft Word

Best Practices:

- Styles – use to create structure, consistency, and navigation




- Table of Contents – for screen reader navigation
- Sans Serif font (Helvetica, Arial, Geneva)
- Alternative Text – for images or graphical objects
- Tables – used to convey data only, not used for formatting
- Hyperlinks – descriptive wording

# Microsoft PowerPoint

Best Practices:

In addition to the Best Practices for Word documents

- Use the built-in themes and pre-formatted slide layouts.
- Give each slide a unique title and check the reading order of slide contents.
- Be sure to check contrast and color for accessibility.
- Eliminate or limit blinking/flashing content to 3 seconds
- Ensure that any action that uses a mouse can also be completed by a using a keyboard.

# Learning Management Systems

Best Practices:

- Create a landing page – orients students to the layout of the course
- Limit the items available on the course menu
- Use modules to arrange your course materials
- Use the same best practices as creating documents and videos:
  - Headings and document structure
  - Caption Videos
  - Hyperlinks
  - Color and Contrast
  - Provide alternative text for images and graphical content
  - Avoid using tables for page layout

# Audio/Video

- Audio – provide a transcript
  - Use a screen reader such as JAWS (subscription) or NV Access (free)
- Video – Closed Captioning
  - YouTube – automatically captions videos
  - Bad Example
  - Better Example
- Best Practices:
  - Accurate, Consistent, Clear, Readable
  - Mixed case characters are preferred
  - No more than two lines per caption
  - Place at the bottom of the screen
  - Sentences broken at a logical point, where speech normally pauses
  - Use a script

# Math Equations and Graphs

- MathType & MathPlayer – Microsoft Word and PowerPoint
- Desmos - Graphing Equations
  - Reads equations
  - Reads coordinates of intercepts and extrema
  - Audio tone changes with position of graph when using trace function
- Video of Screen Reader reading Math Equations
- LaTeX
  - Requires some training (code)
  - Wiris translates equations to LaTeX code
  - Text based and non-graphical
  - Can be used to produce refined documents with mathematical notations and graphics

# Sharing of Best Practices and Strategies

- What challenges have you found in making your digital content accessible?
- What has worked well?

  Best practices, programs, resources, etc. that has helped you create accessible digital content
- What are your next steps to improving the accessibility of your digital content?

## Where do I go from here?

- Create new content with accessibility in mind.
- Modify existing content. Choose one aspect of the course to work on each semester.
- Look for already created accessible content available online or through your college.
- Be sure your college is using the latest version of accessible technology, such as screen readers.

## Thank you!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# General Resources

- University of Minnesota Accessibility U
- Portland Community College – Accessibility for Online Course Content
- Western Governor's University Accessibility Checklist
- Accessibility: Designing and Teaching Courses For All Learners Self-Paced MOOC
- Iowa State University College of Engineering
- Section 508 – Developing Accessible Instructional Course Content
- Web Accessibility in Mind (WebAIM)
- WCAG 2.0 (Web Content Accessibility Guidelines)
- JAWS (Job Access With Speech)
- Visually impaired monitors

# Resources for Formatting in Word and PowerPoint

- Working with Styles in Microsoft Word
- Video Applying and Modifying Styles in Word 2016
- Using the Accessibility Checker in Word and PowerPoint

- WebAIM Color Contrast Checker

# Resources for Captioning Videos

- The National Center on Disability and Access to Education – Captioning YouTube Videos
- Adding Your Own Subtitles and Closed Captions
- How to Caption Someone Else's YouTube Video
- Amara – free subtitling
- National Association for the Deaf Described and Captioned Media Program

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- Math & Science Accessibility Resources PCC
- Accessible Math on the Web (Video)
- Design Science Accessibility Resources for Mathematics
- Tools for Creating Accessible Math
- Talking Scientific Calculator
- Raised Graph Paper
- Texas School for the Blind and Visually Impaired – Teaching Math

# Research

Burgstahler, S. (2013). Websites, Publications, and Videos. In S. Burgstahler (Ed.). Universal design in higher education: Promising practices. Seattle: DO-IT, University of Washington. Retrieved from www.uw.edu/doit/UDHE-promising-practices/resources.html

Hughes, C., & Leavitt, S. (2013). Accessible content creation in mathematics. Retrieved from https://www.pcc.edu/resources/instructional-support/access/documents/math-accessibilityreport.pdf

Rao, K., Edelen-Smith, P., & Wailehua, C. (2015). Universal design for online courses: applying principles to pedagogy. *Online Learning*, *30*(1), 35-52.