How to Make a Book Accessible

Accessibility in Pressbooks

This is an in progress description of steps to take to make a book accessible. It is not perfect or complete, but it outlines some of the things I have determined so far.

Understanding and Testing for Accessibility

Resources and Guides

- Understanding Web Accessibility
- How to Meet WCAG 2.0

Accessibility checkers

Accessibility checkers are useful for seeing larger picture problems. However, their algorithms do not catch everything. For example, if the alt tag for an image is "Image 001", an accessibility checker will detect the presence of an alt tag and assume it is sufficient. However, "Image 001" provides no information to someone who cannot see the image. For this reason, although accessibility checkers are useful, they cannot be 100% relied upon.

So far, the accessibility checker that I have found most useful is WAVE (Web Accessibility Evaluation Tool). It will go through the chapter and labels errors, potential problems, and features. It is useful because it provides a visual representation of accessibility problems and features right on the page itself. It shows the content of alt tags, the heading markup, table markup, and explains possible problems, just as lengthy alt tags, broken links, and skipped heading levels.

Screen Readers (NVDA)

I use NVDA, an open source screen reader that runs on Windows operating systems. It can be downloaded at Download NVDA.

Recommended settings:

- Preferences > Synthesizer > Microsoft Speech API Version 5
- Preferences > Voice Settings > Microsoft Zira Desktop
- Voice settings also allows you to set the rate of speech

However, be careful about changing too many settings as some changes can affect how it a screen reader presents information.

NVDA relies mostly on keyboard commands to navigate around the screen. A helpful list of these commands can be found at NVDA Keyboard Navigation. (If the commands are not working as they should, check the num lock.)

The Specifics

Images: alt=""

Alt tags describe images for those who cannot see them. They should be short but meaningful. Here is a few things to remember:

- All images must have an alt tag. If they don't, the screen reader will read out the file location.
- If an image is purely decorative or if it is adequately explained in the figure description or surrounding text, put "" in the alt tag. This tells the screen reader that although there is an image there, it is not important.
    - From all that I have read, if an image can be skipped the alt tag should be empty like this: alt="". However, through my experimentation with NVDA, that still causes the screen reader to read out the file information. I've solved the problem by having an extra two quotation marks within the alt tag like this: alt="""". When done like this, NVDA will just say "Graphic," and move on. I hope that this is the same for all screen readers and file formats, but I can't be sure.
- Different sources recommend different maximum lengths for alt tags, but WAVE flags any alt tag over 100 characters (including spaces), so I've adopted the 100 character limit. Remember, it is more important to describe the significance of an image than its visual features.
- If an image requires a description longer than 100 characters, there are a number of options:
    - Best practice: Eliminate the need for an image description by using the surrounding text to convey the same information
      Or:
    - Provide a link to a long description. This is a process I've developed based on experimentation with Pressbooks.
    1. In the alt tag, provide a BRIEF (only a few words) image description and say "Long description available."
    2. In the figure caption, after any figure information, provide a link to a long description at the end of the chapter. See Figure 19.4 below.

a. Alt tag: alt="The Mosby Pain Scale. Long description available."
b. Link to long description: [Long Description]
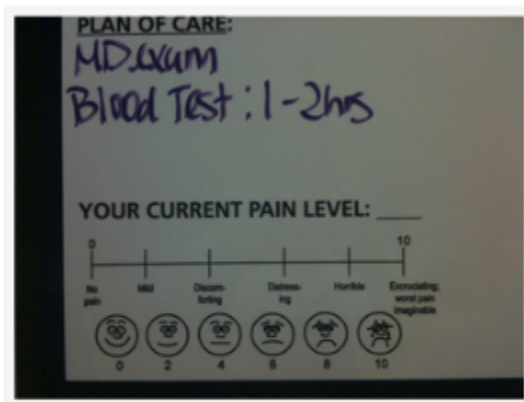

Figure 19.4. The Mosby pain rating scale helps health care providers assess an individual's level of pain. What might a symbolic interactionist observe about this method? [Long Description] (Photo courtesy of wrestlingentropy/flickr)

3. At the end of the chapter, create a Long Description section. All long descriptions will redirect here.
   a. Below is an example of the long description I created for Figure 19.4. When the Long Description link from the image is selected, the focus will shift to this description.
      i. The markup would look as follows:
         <p id="fig19.4">Figure 19.4 long description: The Mosby pain rating scale . . . 10 is a bigger sad face that is crying. [Return to Figure 19.4]</p>
      ii. The Return to Figure 19.4 link is important because it's the only way I've been able to get the screen reader to return keyboard "focus" back to the right spot in the chapter. Pressing backspace will return the screen, but they keyboard focus will remain at the bottom of the page.

Figure 19.4 long description: The Mosby pain rating scale goes from 0 to 10. 0 discomforting, 6 is distressing, 8 is horrible and 10 is excruciating or the worst p used cartoon faces to illustrate the different levels of pain. 0 is smiling, 2 is a sm is a slightly sad face, 8 is a big sad face, 10 is a bigger sad face that is crying. [R

b. If the image being described is a graph or chart, it may be best to describe the content via an accessible table.
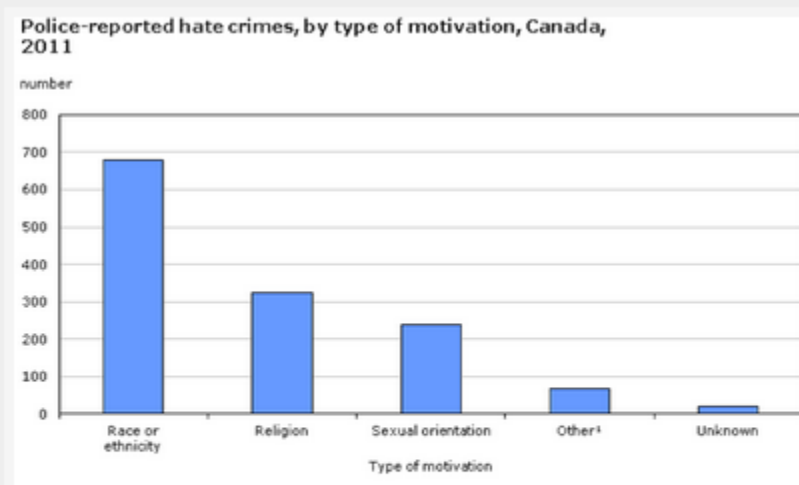

Figure 7.12. In Canada, there were 1,332 reported victims of hate crimes in 2011. The General Social Survey suggests that only one-third of hate motivated incidences are reported to police. [Long Description] (Source: Allen & Boyce, 2013)

i. The above graph presents a lot of visual information that would be difficult to communicate usefully with words. Instead it can be reformatted into a table as seen below.

Long Descriptions

Figure 7.12 Long Description: Police Reported Hate Crimes, by type of m

Type of Hate Crime	Number reported to Police
Race or Ethnicity	690
Religion	315
Sexual Orientation	235
Other	80
Unknown	10

[Return to Figure 7.12]

- Tables presented as images should be replaced with html markup. See Tables for more details on what makes a table accessible.

Tables

Proper table markup is important to ensure screen readers can access table data. In addition, data should be laid out in a way that will make sense when read by a screen reader, which reads row by row, left to right.

Sample markup:

Example table markup.txt

- **Table title:** <caption>Table 2.5. Election Participation 1950-2006 by Age</caption>
    - <caption> tag to be the standard for table titles. This is because when screen readers skip between tables, they will read out the summary attribute (not visible) and the caption (shown on screen).
    - From what I've seen so far, many table titles are located before or after the table, but have no code actually associating them with the table. By using captions for all tables, it will reduce the need to also include a summary tag while still allowing those who use screen readers to navigate between tables.
- **[Skip Table]:**
    - Provide a link to allow a keyboard user to skip the content of a large data table. See the Example table markup link to see how I have been doing it. There may be a better way but this has worked so far.
- **Proper markup**: use <thead> and <th> tags for table headings, this will tell the screen reader to read out the row headings as it goes through the associated data.
- useful attributes:
    - colspan="x" (rows that stretch between an x number of columns)
    - rowspan="x" (columns that stretch between an x number of rows)
    - <table class="bcc-shrink"> (Condenses a table)
    - <td class="source"> (will tell the screen reader to read out this data without referencing the table heading.)

Links

Links have two main requirements to be considered accessible.

- Unless absolutely necessary, links should **not open a new window** when clicked. Opening a new window can be disorientating for people and it complicates navigation.
    - The default setting for links is to redirect to the linked page. They only will open up into a new window when they have a target="_blank" attribute, which can be found with the search and replace function.
    - target="_blank" can be replaced with target="_self", or removed completely
    - If it is absolutely necessary that a page open in a new window, make it clear that it will do so. Example: Use Google [New Window] to search for more information.
- **Link text should describe the purpose/content of the link**
    - People who use screen readers can navigate from link to link and the screen reader will read out the text for the link. For this reason, the link text must be able to describe the content of the link even when taken out of the context of the surrounding text. For example, if a screen reader was to read out the links on this page all the listener would hear is: Link Understanding Web

Accessibility, Link WCAG 2.0, Link WAVE (*Web Accessibiliy Evaluation Tool) etc...
- If a page opens to a PDF, that should also be clear. Example: BCcampus Fall Staff Retreat 2016 [PDF]
- **Recommendation:** For people who have poor vision or are colour blind, it is recommended that links be identifiable by more than just colour. Underlining a link accomplishes this. Regardless, links should meet the colour contrast requirements of WCAG 2.0 when compared to surrounding text. See notes on contrast below.

Contrast

WCAG 2.0: The visual presentation of text and images of text has a contrast ratio of at least 4.5:1, except for the following:

- **Large Text:** Large-scale text and images of large-scale text have a contrast ratio of at least 3:1;
- **Incidental:** Text or images of text that are part of an inactive user interface component, that are pure decoration, that are not visible to anyone, or that are part of a picture that contains significant other visual content, have no contrast requirement.
- **Logotypes:** Text that is part of a logo or brand name has no minimum contrast requirement.

The Colour Contrast Analyzer can be downloaded onto OX and Windows systems. It allows you to select colours to compare from a spectrum or input the colour codes. In addition, it will tell you if the colours selected pass depending on the size of text, and WCAG level.

Navigation

As previously mentioned, there are a number of ways that people using screen readers can navigate through a page. This includes but is not limited to: jumping between links, tables, headings, and images. For this reason, it is important that all of these things are marked up in a way that will make sense when taken out of context. That means meaningful link text for all links, <caption> tag for table titles and a [Skip Table] option, proper heading markup (<h1> <h2>..), and alt text for images.

Links can be used to simplify navigation for mouse and keyboard navigators alike.

- provide links between vocab words and their definitions at the end of chapters/back of the book
  - use the word as the id to keep things simple
  - Vocab word will link to <strong id="vocabword">Vocab Word if they are on the same page.
  - If they are on different pages, you must provide a link to the page the definition is on as well as the id: Vocab word
- provide links between sections/chapters when it could be helpful to be able to switch between them quickly

Continuing Problems/Obstacles

1. I am not sure if there is a way to jump to the table of contents when reading a Pressbooks text book online.
2. There also might be some barriers with navigating the drop down table of contents for the Geology and Canadian history books which have individual pages for each section within a chapter. I think it would be better over all if all sections to a chapter were on the same page.
3. Need to figure out a way to get the screen reader to read -3 as "negative 3", in the Geology textbook. I want to do this without writing (negative) -3 all the way through because that will be confusing for sighted users

Things to consider in the future

Add an accessibility statement to each textbook. This could potentially be used to explain features to both sighted and non-sighted users. Also, it would provide someone to contact in regards to errors and barriers to accessibility.