



California Open Online Library for Education & Accessibility

COOL4Ed (the California Open Online Library for Education) was created so that faculty can easily find, adopt, utilize, review and/or modify free and open etextbooks for little or no cost. The COOL4Ed accessibility open textbook evaluations can inform faculty, staff, and students how the free and open etextbooks meet 15 accessibility “checkpoints” that could impact the learning of learners with a range of disabilities.

SUMMARY OF ACCESSIBILITY EVALUATION:

Textbook: Communications (Boundless)
Format of Textbook: HTML

Assistive Technology (AT) Evaluation Score: Overall	8.0 (Maximum score = 10)
<p>Assistive Technologies (AT) Evaluations applies specialized tools and software in the accessibility evaluation process. These specialized assistive technologies, see list below, are typically not used or available by the general public into the accessibility evaluation process.</p> <ul style="list-style-type: none"> • Accessibility features of desktop operating systems (e.g. high-contrast display themes, settings from the Keyboard and Mouse control panels) • Accessibility-related software included with desktop operating systems (e.g. VoiceOver, Microsoft Narrator) • Third-party accessibility software and hardware: • Screen readers (e.g. JAWS, Window Eyes) • Magnification software (e.g. ZoomText Magnifier/Reader, MAGIC Pro with Speech) • Reading software for users with learning disabilities (e.g. Read and Write Gold, Kurzweil 3000) • Refreshable Braille displays 	
Non- Assistive Technology (NAT) Evaluation Score: Overall	7.3 (Maximum score =10)
<p>Non-Assistive Technologies (NAT) Evaluations applies only native or basic tools and software such as the keyboard and Narrator in the accessibility evaluation process. These non-assistive technologies are readily available and used by the general public.</p>	



COOL4Ed Accessibility Evaluation Methods:

The California State University [Accessible Technology Initiative](#) and [MERLOT](#) (Multimedia Educational Resources for Learning and Online Teaching) developed the rubric or “checkpoints” for the accessibility evaluation. [CAST](#), a nationally recognized organization with expertise in accessibility and UDL, reviewed and affirmed the appropriateness and value of the accessibility evaluation rubric and contributed the references and support resources to help people learn how best to design, evaluate, and remediate the learning materials to maximize the accessibility of the learning resources for all. The “checkpoints” have been built upon the Section 508 technical standards and has been organized and tailored to the typical characteristics of digital resources used in higher education courses.

The accessibility evaluations were performed by the [Center for Usability in Design and Accessibility](#) at California State University, Long Beach; faculty and graduate students with expertise in human factors, usability, and accessibility performed the evaluations of over 150 free and open etextbooks. COOL4ed.org has published the accessibility evaluation rubric and provides a detailed description of the methodology used to evaluate the accessibility of the etextbooks in COOL4ed.

LOOKING FOR DETAILED ACCESSIBILITY REPORTS?

[See Detailed Accessibility Evaluation Report using Assistive Technologies](#)

[See Detailed Accessibility Evaluation Report using Non-Assistive Technologies](#)



DETAILED ACCESSIBILITY EVALUATION REPORT using Assistive Technologies

Assistive Technologies (AT) Evaluations applies specialized tools and software in the accessibility evaluation process. These specialized assistive technologies, such as Kurzweil and NVDA, are typically not used or available by the general public into the accessibility evaluation process.

1. Accessibility Documentation

A. The organization providing the online materials has a formal accessibility policy.	Fail
Additional Information:	Does not find any related information.
B. The organization providing the online materials has an accessibility statement.	Fail
Additional Information:	Does not find any related information.
C. An Accessibility Evaluation Report is available from an external organization.	Fail
Additional Information:	Does not find any related information.

2. Text Access

A. The text of the digital resource is available to assistive technology that allows the user to enable text-to-speech (TTS) functionality.	Pass
Additional Information:	Able to read all text. However, NVDA also reads the dropdown menu items even though they are not shown on the screen, and gets really annoying when the dropdown has 50 items.

3. Text Adjustment

A. Text is compatible with assistive technology.	Pass
Additional Information:	Able to zoom in and out.
B. The resource allows the user to adjust the font size and font/background color (or is rendered by an application such as a browser,	Pass



media player, or reader) that offers this functionality).	
Additional Information:	Able to adjust font and background colors.

4. Reading Layout

A. Text of the digital resource is compatible with assistive technology that allows the user to reflow the text by specifying the margins and line spacing (or is rendered by an application such as a browser, media player, or reader that offers this functionality).	Pass
Additional Information:	Able to reflow text but margins are not the same.
B. If the digital resource is an electronic alternative to printed materials, the page numbers correspond to the printed material.	N/A
Additional Information:	No available materials.

5. Reading Order

A. The reading order for digital resource content logically corresponds to the visual layout of the page when rendered by assistive technology.	Pass
Additional Information:	Follows logical reading orders, but again reading dropdown menu items that are not on screen is really annoying.

6. Structural Markup/Navigation

A. The text of the digital resource includes markup (e.g. tags or styles) that allows for navigation by key structural elements (chapters, headings, pages) using assistive technology (or is rendered by an application such as a browser, media player, or reader that offers this functionality).	Pass
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Additional Information:	Heading level 2 is before heading level 1, there is level 5 but no level 3 or 4.
B. The text of the digital resource includes markup for bullets and numbered lists that is compatible with assistive technology (or is rendered by an application such as a browser, media player, or reader that offers this functionality).	Pass
Additional Information:	10 out of 10 lists worked (Chapter 1).
C. If the text of the digital resource is delivered within an ebook reader application, a method is provided that allows users to bypass the reader interface and move directly to the text content that is compatible with assistive technology.	N/A
Additional Information:	

7. Tables

A. Data tables include markup (e.g. tags or styles) that identifies row and column headers in a manner that is compatible with assistive technology (or are rendered by an application such as a browser, media player, or reader that offers this functionality).	N/A
Additional Information:	Did not find any tables (Chapter 5). However, on homepage, NVDA did not recognize table of contents as a table (if applicable).

8. Hyperlinks

A. In-book links take you to a location within the textbook. For example, the table of contents would be considered in-book links and embedded links take you to the correct location in the book.	
Additional Information:	



B. Live hyperlinks take you to any website or webpages external to the book.	Pass
Additional Information:	When tab through the header, it goes through the subject table (which is not shown on page) 3 times before continue on the page.
C. Live links take you to the correct webpage that is functioning properly.	Pass
Additional Information:	50 out of 50 tested links worked (Chapter 5).
D. Live links are descriptive enough for the users to know where it should take them.	Pass
Additional Information:	45 out of 50 links (90%) are descriptive. Most links are informative, only at the bottom of each topic the source citation shows the full link address. (Chapter 5).

9. Color and Contrast

A. All information within the material that is conveyed using color is also available in a manner that is compatible with those that do not perceive color, and information conveyed by color is also conveyed in other ways.	Pass
Additional Information:	All links are in blue.
B. Information is conveyed from the sub-categories for contrast.	Pass
Additional Information:	See detail descriptions below.
C. Contrast for headers passed WCAG AA standards for large texts (contrast ratio 3:1).	Fail
Additional Information:	Black on white passed. Blue on white, white on green did not pass.
D. Contrast for text passed WCAG AA standards for normal texts (contrast ratio of 4.5:1).	Pass
Additional Information:	Black on white passed. Gray on white did not pass.



E. Contrast for simple images (for example, images of atoms) passed WCAG AA standards (contrast ratio of 4.5:1).	Pass
Additional Information:	Some pass (volume) some don't (Extemporaneous Speeches).

10. Language

A. The text of the digital resource includes markup that declares the language of the content in a manner that is compatible with assistive technology.	Fail
Additional Information:	Did not find lang code.
B. If the digital resource includes passages in a foreign language, these passages include markup that declares the language in a manner that is compatible with assistive technology.	N/A
Additional Information:	

11. Images

A. Non-decorative images have alternative text that is compatible with assistive technology (or is rendered by an application such as a browser, media player, or reader that offers this functionality).	Pass
Additional Information:	NVDA did not registered any images when you press the "g" hotkey. When using mouse hover across an image, some images have no alt text so NVDA just read the link addresses, some images have alt text that matches the image's text title.
B. Decorative images are marked with null alternate text or contain markup that allows them to be ignored by assistive technology.	Pass
Additional Information:	Only recognizes 3 icons (Assign, Book, and Quiz), and not other icons (Heading) (Chapter 5).



<p>C. Complex images, charts, and graphs have longer text descriptions that are compatible with assistive technology (or are rendered by an application such as a browser, media player, or reader) that offers this functionality).</p>	<p>Pass</p>
<p>Additional Information:</p>	<p>For those images that have alt text, the descriptive is just the title and does not have good notations (chapter 5).</p>

12. Multimedia

<p>A. A synchronized text track (e.g. open or closed captions) is provided with all video content.</p>	<p>N/A</p>
<p>Additional Information:</p>	<p>Did not find any multimedia (chapter 4 and 5).</p>
<p>B. A transcript is provided with all audio content.</p>	<p>N/A</p>
<p>Additional Information:</p>	<p>Did not find any multimedia (chapter 4 and 5).</p>
<p>C. Audio/video content is delivered via a media player that is compatible with assistive technology. This includes support for all criteria listed in Section 15 below.</p>	<p>N/A</p>
<p>Additional Information:</p>	<p>Did not find any multimedia (chapter 4 and 5).</p>

13. Flickering

<p>A. The digital resource content does not contain anything that flashes more than three times in any one-second period.</p>	<p>Pass</p>
<p>Additional Information:</p>	<p>No flickering.</p>

14. Science, Technology, Engineering, and Math (STEM)

<p>A. STEM figures have appropriate markup that indicates that the image is a figure.</p>	<p>N/A</p>
<p>Additional Information:</p>	



B. STEM graphs have appropriate markup that indicates that the image is a graph.	N/A
Additional Information:	
C. STEM equations have appropriate markup that indicates that the image is an equation.	N/A
Additional Information:	
D. STEM tables have appropriate markup that indicates the image is a table.	N/A
Additional Information:	
E. STEM figures have appropriate notation markup that conveys both the notation (presentation) and meaning (semantics) of the STEM content.	N/A
Additional Information:	
F. STEM graphs have appropriate notation markup that conveys both the notation (presentation) and meaning (semantics) of the STEM content.	N/A
Additional Information:	
G. STEM equations have appropriate notation markup that conveys both the notation (presentation) and meaning (semantics) of the STEM content.	N/A
Additional Information:	
H. Assistive technology used can access the content from the STEM tables.	N/A
Additional Information:	

15. Interactive Elements

A. Each interactive element (e.g. menu, hyperlink, button) and function (e.g. annotations) allows keyboard-only operation both with and without assistive technology.	N/A
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Additional Information:	
B. Each interactive element conveys information to assistive technology regarding the element’s name, type, and status (e.g. “Play, button, selected”).	N/A
Additional Information:	
C. All instructions, prompts, and error messages necessary to complete forms are conveyed as text to assistive technology (or are rendered by an application such as a browser, media player, or reader that offers this functionality).	N/A
Additional Information:	

DETAILED ACCESSIBILITY EVALUATION REPORT using Non-Assistive Technologies

Non-Assistive Technologies (NAT) Evaluations applies only native or basic tools and software such as the keyboard and Narrator in the accessibility evaluation process. These non-assistive technologies are readily available and used by the general public.

1. Accessibility Documentation

A. The organization providing the online materials has a formal accessibility policy.	Fail
Additional Information:	No content found.
B. The organization providing the online materials has an accessibility statement.	Fail
Additional Information:	No content found.
C. An Accessibility Evaluation Report is available from an external organization.	Fail
Additional Information:	No content found.



2. Text Access

A. The text of the digital resource is available to assistive technology that allows the user to enable text-to-speech (TTS) functionality.	Pass
Additional Information:	

3. Text Adjustment

A. Text is compatible with assistive technology.	Pass
Additional Information:	
B. The resource allows the user to adjust the font size and font/background color (or is rendered by an application such as a browser, media player, or reader) that offers this functionality).	Pass
Additional Information:	

4. Reading Layout

A. Text of the digital resource is compatible with assistive technology that allows the user to reflow the text by specifying the margins and line spacing (or is rendered by an application such as a browser, media player, or reader that offers this functionality).	N/A
Additional Information:	
B. If the digital resource is an electronic alternative to printed materials, the page numbers correspond to the printed material.	N/A
Additional Information:	No page numbers.

5. Reading Order

A. The reading order for digital resource content logically corresponds to the visual layout of	N/A
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the page when rendered by assistive technology.	
Additional Information:	

6. Structural Markup/Navigation

A. The text of the digital resource includes markup (e.g. tags or styles) that allows for navigation by key structural elements (chapters, headings, pages) using assistive technology (or is rendered by an application such as a browser, media player, or reader that offers this functionality).	N/A
Additional Information:	
B. The text of the digital resource includes markup for bullets and numbered lists that is compatible with assistive technology (or is rendered by an application such as a browser, media player, or reader that offers this functionality).	N/A
Additional Information:	
C. If the text of the digital resource is delivered within an ebook reader application, a method is provided that allows users to bypass the reader interface and move directly to the text content that is compatible with assistive technology.	N/A
Additional Information:	

7. Tables

A. Data tables include markup (e.g. tags or styles) that identifies row and column headers in a manner that is compatible with assistive technology (or are rendered by an application such as a browser, media player, or reader that offers this functionality).	N/A
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Additional Information:	
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8. *Hyperlinks*

A. In-book links take you to a location within the textbook. For example, the table of contents would be considered in-book links and embedded links take you to the correct location in the book.	N/A
Additional Information:	
B. Live hyperlinks take you to any website or webpages external to the book.	Pass
Additional Information:	No hyperlinks to external sites.
C. Live links take you to the correct webpage that is functioning properly.	N/A
Additional Information:	
D. Live links are descriptive enough for the users to know where it should take them.	N/A
Additional Information:	

9. *Color and Contrast*

A. All information within the material that is conveyed using color is also available in a manner that is compatible with those that do not perceive color, and information conveyed by color is also conveyed in other ways.	Pass
Additional Information:	
B. Information is conveyed from the sub-categories for contrast.	Pass
Additional Information:	
C. Contrast for headers passed WCAG AA standards for large texts (contrast ratio 3:1).	Fail
Additional Information:	4.26:1



D. Contrast for text passed WCAG AA standards for normal texts (contrast ratio of 4.5:1).	Pass
Additional Information:	
E. Contrast for simple images (for example, images of atoms) passed WCAG AA standards (contrast ratio of 4.5:1).	N/A
Additional Information:	No images with important text.

10. Language

A. The text of the digital resource includes markup that declares the language of the content in a manner that is compatible with assistive technology.	Fail
Additional Information:	
B. If the digital resource includes passages in a foreign language, these passages include markup that declares the language in a manner that is compatible with assistive technology.	Fail
Additional Information:	

11. Images

A. Non-decorative images have alternative text that is compatible with assistive technology (or is rendered by an application such as a browser, media player, or reader that offers this functionality).	Pass
Additional Information:	None
B. Decorative images are marked with null alternate text or contain markup that allows them to be ignored by assistive technology.	Pass
Additional Information:	No alt text
C. Complex images, charts, and graphs have longer text descriptions that are compatible	Pass



with assistive technology (or are rendered by an application such as a browser, media player, or reader) that offers this functionality).	
Additional Information:	None

12. Multimedia

A. A synchronized text track (e.g. open or closed captions) is provided with all video content.	Pass
Additional Information:	No multimedia.
B. A transcript is provided with all audio content.	Pass
Additional Information:	No multimedia.
C. Audio/video content is delivered via a media player that is compatible with assistive technology. This includes support for all criteria listed in Section 15 below.	Pass
Additional Information:	No multimedia.

13. Flickering

A. The digital resource content does not contain anything that flashes more than three times in any one-second period.	Pass
Additional Information:	None

14. Science, Technology, Engineering, and Math (STEM)

A. STEM figures have appropriate markup that indicates that the image is a figure.	N/A
Additional Information:	No STEM
B. STEM graphs have appropriate markup that indicates that the image is a graph.	N/A
Additional Information:	No STEM



C. STEM equations have appropriate markup that indicates that the image is an equation.	N/A
Additional Information:	No STEM
D. STEM tables have appropriate markup that indicates the image is a table.	N/A
Additional Information:	
E. STEM figures have appropriate notation markup that conveys both the notation (presentation) and meaning (semantics) of the STEM content.	N/A
Additional Information:	No STEM
F. STEM graphs have appropriate notation markup that conveys both the notation (presentation) and meaning (semantics) of the STEM content.	N/A
Additional Information:	No STEM
G. STEM equations have appropriate notation markup that conveys both the notation (presentation) and meaning (semantics) of the STEM content.	N/A
Additional Information:	No STEM
H. Assistive technology used can access the content from the STEM tables.	N/A
Additional Information:	

15. Interactive Elements

A. Each interactive element (e.g. menu, hyperlink, button) and function (e.g. annotations) allows keyboard-only operation both with and without assistive technology.	N/A
Additional Information:	
B. Each interactive element conveys information to assistive technology regarding the	N/A



element's name, type, and status (e.g. "Play, button, selected").	
Additional Information:	
C. All instructions, prompts, and error messages necessary to complete forms are conveyed as text to assistive technology (or are rendered by an application such as a browser, media player, or reader that offers this functionality).	N/A
Additional Information:	

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