Library eResources Accessibility Project (LEAP)

Interim Report (v.1)

Phase 2: Accessibility Needs Assessment & Criteria Report

Phase 3: Content Development & Tool Recommendations

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with the support of the LEAP Steering Committee
on behalf of the HLLR-AODA Committee for Ontario College Libraries

Spring/Summer 2017
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We are also indebted to the expertise of our students on the **Accessibility Advisory Group** who volunteered their time to bring us their invaluable knowledge of and experience with adaptive technology and alternate formats.

Alternate Formats
This report is available in alternate formats upon request. Please contact: [cabba@georgebrown.ca](mailto:cabba@georgebrown.ca), thank you.
Executive summary

The Integrated Accessibility Standards under the Accessibility for Ontarians with Disabilities Act (AODA) require that libraries of educational institutions make their eresources accessible by January 1, 2020 (IASR, 2011, s. 18(3)).

To this end Ontario college libraries are looking to establish accessibility best practices, and develop a tool to evaluate the accessibility of library eresources. The goal is to recommend workflows for implementing the evaluation tool at the local level, and to allow Ontario college libraries to collaborate on evaluations and share their results.

This document has been authored by the LEAP Research Team, with User Personas developed by the LEAP Steering Committee. This document summarizes the accessibility needs taken into consideration and the criteria used to develop instructional content for preliminary modules that will serve to inform the tool development phase of the project.

This document provides information about the genesis of this initiative from its inception, through a summary of our research to date, concluding with project recommendations for the Heads of Library and Learning Resources Colleges Ontario (HLLR).

Module development

As part of our environmental scan we surveyed a few hundred criteria from a range of web accessibility standards. A list of 66 accessibility criteria was initially developed for this project, which was then further distilled to 33 applicable criteria. The finalized criteria were then broken down into four modules in order to facilitate easy eresource testing.

Each module is written in plain language assuming minimal technical knowledge and, where appropriate, is accompanied by examples in order to make this evaluation tool usable for all library staff. Further details on the intended use of these modules can be found in the LEAP Guide.

When evaluating electronic resources, one must look at both the interface platform as well as the content. This tool is organized into two parts which address each one of these areas. Testing content has been broken down into four modules as follows:

Module 1: Appearance
Module 2: Navigation
Module 3: Structure
Module 4: Content

Each module was designed to be fairly autonomous and does not rely on the completion of the previous module. Staff time and capacity were taken into consideration when developing this tool and it was understood that the evaluation and
testing might not always take place within a specific limited timeframe but over a week or several weeks depending on staff availability. To this end staff could use these modules to test various aspects of the eresource in question or even divide responsibility for different modules across a team of library staff.

Based on usability testing and further review of the four modules, a section with technology options was written to inform future development of this tool. Several options have been included in this report taking into consideration usability feedback and testing, technology availability, costs and available resources.

**Tool Recommendations**

The best way to move forward with LEAP tool development is to build a fully customized site in Drupal. If long-term sustainability, collaboration, and use by wider audiences are important considerations, then building something high quality and open source is the best solution.

While initial costs, time commitment and human resources requirements are certainly factors for consideration for this option, a custom site would be the most sustainable option, reducing reliance on third party applications which when pieced together as a makeshift solution can sometimes create technical errors and behave in unpredictable ways.

Although a customized site may extend the time allotted to the tool development phase, we recommend using the four modules developed in Google Forms as a temporary solution to offer access to Ontario library staff as soon as possible.

**About**

**Background**

The primary purpose of the Library eResources Accessibility Project (LEAP) is to assist Ontario college libraries in upholding accessibility best practices and becoming compliant with the requirements of the Accessibility for Ontarians with Disabilities Act (AODA), particularly the January 1, 2020 deadline for ensuring the accessibility of electronic resources (IASR, 2011, s. 18(3)).

The goals of the Library eResources Accessibility Project includes the following work which has been completed:

- Identifying accessibility standards for evaluating eresources according to our research findings, and as recommended by other existing best practices
  - LEAP Environmental Scan
• Establishing a checklist of criteria for evaluating eresources, based on those standards;
  o LEAP Criteria Research
• Creating instructional content and plans for a self-audit tool for evaluating eresources based on those standards
  o LEAP Modules

Along with the remaining goals that we must complete:
• Building a tool which facilitates and houses evaluations and accessibility reports;
• Recommending a way for colleges to integrate the evaluation process into their local workflows;
• Recommending a way that the colleges can pool their resources and share completed evaluations with each other;
• Building awareness and capacity among college library staff regarding accessibility.

Objectives

The purpose of the criteria development phase of the LEAP project is to determine a list of accessibility criteria that the Ontario college libraries will use to evaluate the accessibility of eresources. As discussed in the Library eResources Accessibility Project (LEAP) Environmental Scan (v. 1.2), the AODA legislation does not provide any specific compliance requirements for eresources beyond a deadline. We must look to existing accessibility standards and best practices to determine a baseline for the Ontario college libraries.

Our objectives for this phase are as follows:

• Compile a list of all accessibility criteria from the different standards identified in the environmental scan (WCAG 2.0, Section 508, Barrier Walkthrough, Tatomir Accessibility Checklist, and ASCLA Think Accessible Before You Buy)
• Supplement this list with any accessibility criteria specific to different content types (e.g. full text including PDFs, images, audio, video, etc.)
• Sort these criteria into macro categories: definite inclusion, needs further research, redundant, not relevant, out of scope/beyond capacity
• Conduct any further research needed to understand specific criteria and how they can be evaluated

Vision Statement

The LEAP modules have been conceptualized as a flexible resource any library staff can use independently or in collaboration with others to produce evaluation reports which can be shared across member institutions via a repository as well as retained at the institutional level. These modules are intended to be further developed as an online self audit tool which primarily takes advantage of free and widely available software and
plugins to conduct evaluations as well as provides an educational piece from which staff can learn to develop more advanced competencies in the area of digital accessibility. The continued development of this tool offers an advocacy opportunity whereby HLLR, OCLS and Ontario Colleges have a unique chance to establish a community of practice around inclusive library resources.
Understanding user needs

In order to identify which criteria would be most productive for evaluating the accessibility of eresources, we wanted to ensure we had a good understanding of the variety of users and accessibility needs that should be taken into consideration.

After conducting some background research, we decided to document our understanding in two ways: accessibility needs and user personas. These are meant to serve as tools for the LEAP Steering Committee and future project contributors to reference as we move forward with the project.

Accessibility needs

We wanted to acknowledge that users are diverse, and have a wide range of abilities and needs.1 While there are many different ways to categorize and label disabilities, we decided instead to focus on identifying a list of accessibility needs. This allowed us to:

- Acknowledge the variability of user needs. For example, users may have accessibility needs that are temporary, permanent, situational, intermittent, or some combination thereof.
- Acknowledge the diversity of user needs, instead of over-generalizing broad categories. For example, one user with low vision might have very different needs than another user with low vision.
- Acknowledge that user needs may cross multiple disability categories. For example, a user may have both auditory and cognitive needs.
- Focus on the needs that were most relevant to the library eresource context.
- Recognize that some accessibility criteria can improve the usability of an eresource for a wide range of users, with a wide range of accessibility needs.

To take these accessibility needs into account we have outlined the diversity of user needs and created user personas to acknowledge our users without diminishing their diversity and complexity and to ensure they are defined by their abilities, aptitudes and attitudes. Please see Appendix A for details.

Identifying accessibility criteria

According to the AODA, by January 1, 2020, the libraries of educational and training institutions shall “provide, procure, or acquire by other means” digital resources in an “accessible or conversion ready format” for a person with a disability, upon request (IASR, 2011, s. 18(3)).

However, as discussed in the LEAP Environmental Scan, the AODA does not provide any specific details for what this means. As such we needed to look elsewhere for guidance

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1 https://www.w3.org/WAI/intro/people-use-web/diversity
to determine what existing standards and best practices should be used to ensure that library e-resources are accessible.

## Methodology

During our environmental scan, we also learned that the conformance review approach to determine whether a product or system meets some specified standard is not always reliable or effective in identifying actual accessibility problems, especially when it is performed by non-experts. However, a “barrier walkthrough” approach, which provides evaluators with a list of predefined barriers based on established accessibility principles, has been found to be easier to evaluate and more effective in identifying major problems. As such, our goal is to present our criteria as specific barriers rather than conformance statements.

We began by surveying a few hundred criteria gathered from a wide range of web accessibility standards:

- Web Content Accessibility Guidelines 2.0
- Section 508 Amendment to the Rehabilitation Act
- Barrier Walkthrough
- Tatominr Accessibility Checklist
- ASCLA Think Before You Buy
- Matterhorn Protocol 1.02

We then compiled these standards into a master list:

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In narrowing down the list of criteria, the following principles have been guiding our strategy:

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2 Library eResources Accessibility Project (LEAP): Phase 1: Environmental Scan (v. 1.2). Prepared by Mari Vihuri, Ontario Colleges Library Service (OCLS) on behalf of the HLLR AODA Committee for Ontario College Libraries (September 2015).

3 Ibid.
● Accessibility needs addressed
● Frequency of appearance on multiple lists
● Relevance to library eresource context
● Application to eresource interfaces and/or content
● Ease of evaluation (technical expertise required, time or labour intensive, subjectivity involved, lack of clear standards/guidance, etc.)
● Likelihood of producing effective results

Working criteria
A list of evaluation criteria for eresources was developed in the format of a Google Spreadsheet to address some of the following accessibility issues identified early in the project.

● There is non-textual content without a textual equivalent.
● The page prevents the user from resizing text, or resized text is unreadable (e.g. cut-off, too narrow, etc.).
● Information, structure, and relationships can be programmatically determined.
● Headings and labels describe topic or purpose.
● The page is not organized into sections.
● There are instructions for understanding or operating content that rely solely on sensory characteristics (e.g. shape, size, visual location, orientation, or sound.)
● There is content where colour is used as the only visual means of conveying information, indicating an action, prompting a response, or distinguishing a visual element
● The visual presentation of text and images does not meet the contrast ratio of at least 4.5:1 (AA) or 7:1 (AAA).
● There is no mechanism available to bypass repeated blocks of content.
● If a Web page can be navigated sequentially and the navigation sequences affect meaning or operation, focusable components receive focus in an order that preserves meaning and operability.
● There is information in a table but the columns and rows cannot be identified by screen readers.

The list of 66 criteria initially presented to the Steering Committee (LEAP Criteria Research) was evaluated for relevancy as it relates to electronic resources and criteria were ranked depending on whether they must be included, whether that determination was undecided or whether the criteria was out of scope. This document then provided the basis for the LEAP criteria including all must criteria as it applied to eresource
interface, appearance and content. The result was the development of four modules using the 33 criteria to conduct tests using different software applications and extensions. The list of all 33 criteria can be found in Appendix B.

**Content Development**

As mentioned above, a list of 33 must criteria was extracted from the spreadsheet to be grouped and broken down into four modules addressing interface appearance, navigation, structure and content. The researcher worked from notes in the spreadsheet and incorporated the Steering Committee’s comments into the development of plain language and easy to understand tests.

The researcher worked in consultation with the LSC Chair and the LEAP Project Manager to keep the project on track by having weekly and bi-weekly meetings and to effectively engage with stakeholders through surveys. Four modules were tested by the LEAP Steering Committee (LSC) in two phases: first three modules related to eresource interface were tested together using Google Forms to simulate the appearance and feel of what a modular tool might look like, and the fourth module was tested as a WORD document to evaluate difference of experience in using different formats.

Feedback was collected via two questionnaires distributed alongside each testing phase. Feedback from the first round of testing was incorporated into the development of the fourth and remaining module which was distributed with a revised questionnaire.

Most responses received from the LEAP Steering Committee testing process supported both the modular format and the WORD document format. Members responded positively to the organization of tests which were broken down into small manageable sections. Some expressed an interest to see less repetition of criteria across different modules even if it applied to testing different aspects of the interface. (Appendix C; Appendix D).

The format of questions and evaluation criteria resulted in a more extended discussion when reviewing this feedback. Requests were made for visual cues (ie. screenshots) or descriptive examples to be incorporated with instructions and should be included as this project moves to the next phase of development. This informed the development of the fourth module and retroactive editing of the first three modules.

The biggest challenge in addressing feedback was related to scoring performance in determining how this assessment should add up results: should all questions be framed in the negative, should there be multiple choices and could there be a consistent format across all tests? Additional editorial review took place to ensure as much consistency as possible although depending on the nature of the test, not all questions could be phrased in the same way. Scoring performance will be highly reliant on the technology used for the development of this tool and its capacity for numerical evaluation.
While the LSC was asked to test several modules at a time and on a fairly short time-frame, a normal day-to-day evaluation would likely involve a more gradual step-by-step testing with more time to complete evaluations. As a result, it is our assessment that repetitions across modules would be felt less acutely and the difference in question formatting less of a barrier.

According to the feedback received from the LSC, we assessed that on average each module took 30 to 90 minutes to complete. A request was made to be able to save uncompleted work to return to it at some point later. This feedback has been incorporated into the Tool Recommendations section below. Since some sections required access to IT administrators in order to install extensions, the initial setup process took a bit longer at the outset.

Additional feedback was collected from the LEAP Student Advisory group via a survey asking students to share their experience using library databases and to clarify some of the less defined accessibility criteria to help focus the testing process where standards are not very clear (Appendix E).

Cited among some of the biggest barriers to successful navigation of eresources were pop-up messages and error reports. The value of properly structured content and headings was reinforced for those who use screen readers. Audio/Video criteria was included in the last module on content. This section could be further developed to incorporate other multimedia content.

To further address feedback from the Steering Committee regarding the organization and formatting of questions in the modules, an introductory LEAP Guide has been created to provide context for how the LEAP tool is organized, addressing time commitments, how to prepare for testing, technology index, etc, to establish the process involved and to help build familiarity with how to use the modules.

Tool Recommendations

Interface & Modules

Currently the modules are in Google Forms and Google Documents. The following requests were put forth by members of the LEAP Steering Committee which should inform future iterations of this project, including tool development:

- The ability to save work, pause and return on another day
- One test per page, instructions can be detailed and lengthy
- The need to add visual cues (ie. screenshots) or descriptive examples with instructions
- A review of and recommendations for scoring performance options
- Suggestion from Research Consultant to create an introductory LEAP Guide, or FAQ on how the tool is organized
○ Guidance provided around what applications, software and other resources are required to complete tests, with instructions, as needed - see Technical Support
○ Ability to skip tests and have documented proof of what has been skipped
○ Opportunity to generate a summary of each test in a final report format
○ Final reports should flag some unanswered or untested criteria and should come in a format library staff can edit to incorporate personal notes
○ Final reports should be shared with participating colleges, procurement departments, OCLS committees and other institutions, as appropriate
○ A mechanism for sharing needs to be developed and a process to eliminate duplication of effort established
○ The tool and final reports should initially sit on a password-protected site such as OCLS with either individual authentication or potentially one login per institution to be shared by several library staff (could be housed on OCLS website which already has this type of authentication);
○ As workflows become well established and the quality/accuracy of tests ensured, this tool should be made open to any other institutions interested (OCUL, public library sector, etc.)

**Community of Practice**

- When the tool is ready for launch, training will be provided to the college library community to build competencies and familiarity with accessibility criteria and the assessment process
- Annually reviews should be scheduled to assess community comfort levels with this tool and how it's being used, and make recommendations for peer to peer mentorship to increase capacity/capacity building (this could take place in the format of webinars, email support/listserv or in-person training events with technology demos)
- Workflow reports could be developed around this tool taking into consideration Steering Committee feedback - when to use it and how (see survey responses below):
  - *It could also be used to evaluate our existing resources*
  - *This tool could be used when a trial for a potential new resource is requested*
  - *Findings from these evaluations could be taken to the vendors*
    - *Results may give library staff a better foundation for addressing accessibility issues with third party providers*
    - *May contribute to the development of shared language for eresource agreements and other supports*
  - *Could be used to report findings to interest groups (including AODA committees) or to users requesting information*
Technical support

- The tool needs to be prefaced with a technology/software section which would list everything library staff would require access to (including IT support to install).
- For tool maintenance and updates, a determination will be required to assess whether it is more effective to nominate one person to ensure content is current (and who that person might be) or if this task would be better served by a committee.
- There should be an annual assessment of which browsers people are using and a feedback mechanism for community input with regard to currency of tests to ensure relevance of instructions provided or new instructions developed where appropriate in support of new software or browser versions.

Model for Shared Access and Workload

Consortial Level

- Reports need to be shared across institutions so that work is not being duplicated.
- A community will need to be established around how information is shared and with whom, examples: OCLS eResource Audit group; LEAP Quality Control Community.
- Determine if and how this tool may be opened to other organizations who are interested to participate e.g. OCUL/COPPUL, Public Libraries; and options that accommodate their desired level of contributions and commitments.
- Establish a process and a schedule whereby colleges would not end up testing identical databases but could distribute testing across all institutions (crowdsourcing style).
- Develop a model for crowdsourcing the workload.
- Develop an awareness package to accompany the tool implementation or report sharing process.

Institutional level

- Identify the staff member(s) at each institution who will participate in assessing e-resources on behalf of their institution.
- Develop an allocation process for library staff assessments, such as a sign-up schedule available to all relevant library staff upon log in with information about which e-resources have been/are being assessed.
- Establish expected time commitment from the colleges that can be anticipated to complete these evaluations. E.g. per evaluation, per individual, or per college. This will impact how many criteria will be included.
- Determine who will be able to access the tool to view and/or create evaluations and whether it will be completely public, accessible to all colleges, accessible to colleges who participate as an opt-in service, etc.
• Determine point person(s) and process to communicate assessments results with vendors and think about documentation to share this information consortially.

**Tool: Ongoing Maintenance**

Once the tool has been developed and is ready to be made available to the colleges, there will need to be some decisions made about how the tool will be maintained on a day-to-day basis. The following is a series of questions which will need to be addressed by the LEAP Steering Committee in consultation with membership.

1. **Who will be responsible for monitoring the evaluations?**
   This will involve keeping files organized, resolving conflicts between multiple evaluations of the same site, managing corrections, flagging evaluations for updates, archiving out of date evaluations. This issue is also linked to the question of format, and some formats will require more maintenance than others (although all options will require some degree of maintenance).

2. **How will evaluations be allocated to colleges?**
   Will a list of eresources be divided among the colleges? Will colleges be expected to commit a certain number of evaluations per year, based on their size? If a commitment is expected, who will ensure that colleges are contributing what they have committed to contribute? Or will colleges just be welcome to use the tool when needed and submit evaluations as they create them? Should there be an initiative to populate the database with evaluations of existing eresources when it first launches?

3. **How often should evaluations be updated, and what should be the mechanism for triggering updates?**
   Check all evaluations once a year? When staff receive a notification from a vendor or notice an upgrade somebody flags the evaluation for review?

4. **How will the continued relevance of the tool be ensured?**
   Who will ensure the tool is updated if legislation, standards, technology, or the requirements of users with disabilities change?

5. **How will we integrate screenshots as examples to accompany the tests?**
   Who will help determine where this support is needed? Which tests and modules are more suited to include these examples?

**Tool Options & Associated Costs**

Several tool options were evaluated based on pros and cons with respect to the implications for long-term maintenance, costs, hosting, and customizability. We also considered what kind of ongoing financial commitment (both in terms of set up costs and ongoing costs) would be expected from the colleges including fees for hosting, maintenance, etc. The extent of any ongoing financial commitment will be determined
by decisions around hosting and format, and the potential of becoming an opt-in service following OCLS’s standard cost sharing model. See Appendix F for the evaluations of each option. The LSC will have the opportunity to take recommendations forward to the AODA Committee for discussion, and to OCLS for consultation regarding the project budget and cost estimates before bringing final recommendations to HLLR.

**Recommendations**

The best way to move forward with the LEAP tool development is to build a fully customized site in Drupal. While the initial costs and human resources involved might make this a less appealing option, potentially slowing down the roll-out of the final product, it would be the most sustainable option in the long run reducing any reliance on third party applications/tools which, when pieced together as a makeshift solution can behave in unpredictable ways and create technical errors. If long-term sustainability and use by wider audiences are important considerations, then building something high quality and open source is the best solution.

**Project Plan**

This project has two important components: (1) the development of the website/platform/interface where the testing modules would reside and (2) the development of the modules themselves. The following addresses the requirements, wishlist and implications of each.

**Platform: technical requirements**

- This password-protected site would introduce the organization of the modules, explain what the project is and house any related documentation;
- This platform would also have a repository which would collect final reports, making them visible and/or searchable to anyone with access (with consideration of related privacy issues and whether sharing would be mandatory);
- To house four testing modules; to support testing by embedding engaging step by step instructional content created by the Project Researcher and additional screenshots (as needed) into the tool
- To house a forum space for library staff to ask questions and share best practices.
- A process to assess and attribute a consistent and standardized scoring system (Note: a draft of numerical scores has been included in the LEAP Guide but needs further evaluation and feedback from the Steering Committee).

**Modules: technical requirements**

- To allow individuals with access to conduct a number of tests designed to evaluate accessibility of eresources
To have the capacity to generate a report every time a test is completed
To have the capacity to add up responses towards an evaluation score for each test (this would be counting failures and successes and assigning a numerical score or letter grade)

Required skill sets
The project team should be comprised of the following experts:

- **Project Lead** - A Project Lead to manage a project team, communicating with stakeholders with regard to project milestones/any technical delays, facilitate prototype testing and roll out the final product. This person should have a good understanding of the history of this project, have technical knowledge and capacity to act as the middle person between technical staff and non technical staff in the capacity of a “translator” tailoring communications as appropriate for each group.

- **Chair, LEAP Steering Committee / Project Facilitator** - The LSC Chair will be responsible for elevating decisions to the AODA Committee and ultimately to HLLR as necessary. The Facilitator keeps the project on track and fosters an environment of safe dialogue, participation, and action to allow progress and results to be communicated. The Facilitator works with the Project Lead to liaise with any external consulting resources and to provide administrative support.

- **Tool Development Consultant** - As the next phase of this project requires technical work in building the evaluation tool interface and testing modules. At least one developer or possibly two should be involved depending on the project timeline. This should be an individual(s) with experience in Drupal and ideally someone who has an understanding or experience working in an academic environment. At least one developer would be well versed in accessible web design. This person(s) will work closely with the Project Lead and the LSC Chair and Facilitator to ensure all accessibility criteria is integrated into the tool. The Consultant will work with the Project Lead, the Facilitator, and the LSC Chair, in consultation with the LSC, to ensure that the tool is easy to use and geared towards college library staff (through testing and review). There is the potential for this role to expand based on the recommendations of the LSC.

- **LEAP Steering Committee** - To ensure continuity of resource development, it would be recommended that the whole LEAP Steering Committee continues its active engagement with this project, serving in an advisory capacity.

Assumptions about resources

- That funding is available to engage a third-party tool developer to undertake custom development work of the LEAP tool in Drupal;
- That OCLS staff will have the capacity to manage this project during tool development
• That the LEAP Steering Committee will have the capacity to continue to support this project, with advisory support from HLLR-AODA Committee members.

Takeaway Considerations
Based on roles/responsibilities outlined in the Charter, the next phase of the project will involve the development of the actual evaluation tool. The LEAP project team will be responsible for making recommendations to the LEAP Steering Committee about the initial development of the tool, staffing and community consultations. These recommendations will then be taken to the AODA Committee for review, and ultimately to HLLR for final approval.
Appendix A: Accessibility Needs & User Personas

Visual

Blindness
Legal blindness is commonly defined as a condition in which the best corrected visual acuity is 20/200, or less, or the person's visual field is 20 degrees or less (Center for Persons with Disabilities, Visual Disabilities Introduction, para. 4). These users generally do not use their eyes to access the web, because whatever vision they have is not useful enough for this kind of task (Center for Persons with Disabilities, Visual Disabilities Blindness). These users will often use assistive devices, such as screen readers, to access the content of the web, so it is important to keep in mind some of the limitations of these devices, such as when it comes to images and the overall visual layout of a webpage. Since these users often do not use mice to navigate the web, it is also important to ensure that web content is navigable by keyboard. According to the 2012 Canadian Survey on Disability (CSD), 756,300 (2.8% of Canadian adults) were identified as having a seeing disability that limited their daily activities. Of those who were identified as having a seeing disability, only 5.8% reported that they were legally blind (Statistics Canada, 2016).

Low-Vision
The visual acuity of people with low vision varies widely, but, in general, low vision is defined as a condition in which a person's vision cannot be fully corrected by glasses, thus interfering with daily activities such as reading and driving (Center for Persons with Disabilities, Visual Disabilities Low Vision, para. 1). These users often cannot perceive (see) content that is small, does not enlarge well, or which does not have sufficient contrast (Center for Persons with Disabilities, Visual Disabilities Low Vision). These users will often use assistive devices, such as screen magnifiers, so it is important to ensure that web content is easy to interpret when enlarged. According to the 2012 Canadian Survey on Disability (CSD), 756,300 (2.8% of Canadian adults) were identified as having a seeing disability that limited their daily activities (Statistics Canada, 2016).

Colour Blindness
Color blindness, or color vision deficiency, is the inability or decreased ability to see color, or perceive color differences, under normal lighting conditions (PubMed Health, Color Blindness, para. 1). For these users, it is important to make sure that colors are not the only method of conveying important information. Colour blindness (colour vision deficiency, or CVD) affects approximately 1 in 12 men (8%) and 1 in 200 women in the world (Colour Blindness Awareness, Colour Blindness, para. 1).
Auditory

Deaf/Deafened
The Canadian Association of the Deaf-Association des Sourds du Canada recognizes a person to be medically/audiologically deaf when that person has little or no functional hearing and depends upon visual rather than auditory communication (The Canadian Association of the Deaf-Association des Sourds du Canada, 2015, Definition of “Deaf”, para. 2). In terms of web accessibility, it is important to consider that these users cannot perceive (hear) auditory content, so content such as videos with voices and sounds should contain captions. According to the 2012 Canadian Survey on Disability (CSD), 874,600 (3.2% of Canadian adults) were identified as having a hearing disability that limited them in their daily activities. Among adults aged 15 years and older who were identified as having a hearing disability, 75.2% reported that they had some difficulty hearing, while 22.5% had a lot of difficulty (Statistics Canada, 2016).

Hard-of-Hearing
Auditory disabilities range from mild or moderate hearing impairments in one or both ears (“hard of hearing”), to substantial and uncorrectable impairment of hearing in both ears (“deafness”) (W3C Web Accessibility Initiative, Auditory, para. 1). In addition to captions for audio content on the web, it is important for this user group to have volume control options for audio content. According to the 2012 Canadian Survey on Disability (CSD), 874,600 (3.2% of Canadian adults) were identified as having a hearing disability that limited them in their daily activities. Among adults aged 15 years and older who were identified as having a hearing disability, 75.2% reported that they had some difficulty hearing, while 22.5% had a lot of difficulty (Statistics Canada, 2016).

Deaf-blind
Deafblindness is a complex disability that combines varying degrees of both hearing and visual impairment, making it unique to each individual. Although a person who is deafblind may not be completely deaf or completely blind, they do not have enough of either sense to navigate their environment independently (Deafblind Ontario Services, Deafblindness). Screen readers can also be used by those who are both deaf and blind, but rather than convert text into speech, screen readers for the deaf-blind convert text into Braille characters on refreshable Braille devices (Center for Persons with Disabilities, Visual Disabilities Blindness). In this way, it is important to keep in mind some of the limitations of these devices, such as when it comes to images and the overall visual layout of a webpage. Since these users often do not use mice to navigate the web, it is also important to ensure that web content is navigable by keyboard. In 2004, Stats Canada reported 7,000 Ontarians live with deafblindness (Ontario Deafblind Services, Deafblindness).
Motor/Mobility (Including dexterity, flexibility and pain-related)

Motor impairment is the partial or total loss of function of a body part, usually a limb or limbs. This may result in muscle weakness, poor stamina, lack of muscle control, or total paralysis. Motor impairment is often evident in neurological conditions such as cerebral palsy, Parkinson’s disease, stroke and multiple sclerosis (International Neuromodulation Society, 2014, Motor Impairment, para. 1). These users may not be able to use a mouse, so it is important to ensure that all content is navigable by keyboard. Users may not be able to control the mouse or the keyboard well, so it is important to make sure that pages are error-tolerant (e.g. ask “are you sure you want to delete this file?”), and do not contain small links or moving links. Users may be using voice-activated software, which can replicate mouse movement, but not as efficiently as it can replicate keyboard functionality, so developers should make sure that all functions are available from the keyboard. Overall, it is important to ensure that web content is operable because not everyone can use a mouse, click on small links, or operate dynamic elements effectively (Center for Persons with Disabilities, Motor Disabilities Types of Motor Disabilities). According to the 2012 Canadian Survey on Disability (CSD) 3,031,100 (11.1% of Canadian adults) were identified as having a flexibility or dexterity disability that limited their daily activities (Statistics Canada, 2016).

Cognitive and neurological

Memory

Memory refers to the ability of a user to recall what they have learned over time. A common model for explaining memory involves the concepts of working (i.e., immediate) memory, short-term memory, and long-term memory. Some individuals with cognitive disabilities have difficulties with one, two, or all three of these memory types (Center for Persons with Disabilities, Cognitive Introduction, Memory section). Some users may have memory difficulties that impair their ability to remember how they got to content. When creating forms on the web, developers should consider a complex form that displays multiple error messages at the top of the form when submitted. It may be very difficult for the user to remember multiple errors, or perhaps may even forget the error information before they are even able to address that error (Center for Persons with Disabilities, Cognitive Introduction, Memory section). According to the 2012 Canadian Survey on Disability (CSD) 628,200 (2.3% of Canadian adults) were identified as having a memory disability that limited their daily activities (Statistics Canada, 2016).

Problem-solving

Some individuals with cognitive disabilities have a difficult time solving problems as they arise. In many instances, their resilience can be low and the resulting frustration is such that they choose to leave the site and not persist to solve the problem. One example of this would be the presence of a 404 error from a bad link, or a link that does not take them where they thought they were going (Center for Persons with Disabilities, Cognitive Introduction, Problem-solving section). According to the 2012 Canadian Survey
on Disability (CSD) 622,300 (2.3% of Canadian adults) were identified as having a learning disability that limited their daily activities (Statistics Canada, 2016).

Attention
There are many individuals that have difficulty focusing their attention to the task at hand. Distractions such as scrolling text, blinking icons, and pop-up windows can make the web environment difficult or even impossible to navigate. Even for typical users, such things can be irritating. Good design principles would limit these instances to only that which is necessary to convey the content. Avoiding anything that draws a person’s attention away from the main content and using good design, such as color, white space, and simple presentation can help users focus on important content and functionality. (Center for Persons with Disabilities, Cognitive Introduction, Attention section). According to the 2012 Canadian Survey on Disability (CSD) 622,300 (2.3% of Canadian adults) were identified as having a learning disability that limited their daily activities (Statistics Canada, 2016).

Reading, linguistic, and verbal comprehension
Some individuals have difficulties understanding text. These difficulties may be mild or severe, ranging from minor challenges to a complete inability to read any text. Developers should write as simply and clearly as is feasible, taking into account the primary audience and including those who may have difficulty with some of the content. Non-literal text can be a problem for some of these users, so sarcasm, satire, parody, allegory, metaphor, slang, and colloquialisms should be kept to a minimum (Center for Persons with Disabilities, Cognitive Introduction, Reading, Linguistic and Verbal Comprehension section). According to the 2012 Canadian Survey on Disability (CSD) 622,300 (2.3% of Canadian adults) were identified as having a learning disability that limited their daily activities (Statistics Canada, 2016).

Math comprehension
Mathematical expressions are not easy for everybody to understand. This does not mean that authors should avoid math entirely. For people who are comfortable reading equations and thinking mathematically, the best way to explain mathematical concepts is by using equations. On the other hand, often it is helpful to explain math conceptually, either with or without the formulas. Conceptual explanations help readers understand the reasoning behind the math (Center for Persons with Disabilities, Cognitive Math Comprehension section). According to the 2012 Canadian Survey on Disability (CSD) 622,300 (2.3% of Canadian adults) were identified as having a learning disability that limited their daily activities (Statistics Canada, 2016).
Visual comprehension

Some individuals have difficulties processing visual information. In many ways, this is the opposite of the problem experienced by people with reading and verbal processing difficulties. Individuals with visual comprehension difficulties may not recognize objects for what they are. They may recognize the fact that there are objects on a web page, but may not be able to identify the objects. For example, they may not realize that a photograph of a person is a representation of a person, though they can plainly see the photograph itself (as an object) on the web page. For these people, a moving, talking person in a video may be easier to identify and mentally process than a static image of a person in a photograph. Video and multimedia, accompanied with narration, may be the best way to communicate to these individuals (Center for Persons with Disabilities, Visual Comprehension section). According to the 2012 Canadian Survey on Disability (CSD) 622,300 (2.3% of Canadian adults) were identified as having a learning disability that limited their daily activities (Statistics Canada, 2016).

Seizures

Some people are susceptible to seizures caused by strobing, flickering, or flashing effects. This kind of seizure is sometimes referred to as a photoepileptic seizure because it is caused by pulses of light interacting with the eye's light-receptive neurons and the body's central nervous system. Because of the potentially serious nature of seizures, developers should be extra careful to avoid any graphics, animations, movies, or other objects which have strobing, flickering, or flashing effects. Developers should also avoid graphics which may induce nausea or dizziness, or that may be distracting (Center for Persons with Disabilities, Seizure Disorders). Epilepsy affects approximately 1 in every 100 people in Canada. At least 1 in every 10 people will have one or more seizures in their lifetime (Edmonton Epilepsy Association).

User personas

“A persona is a way to model, summarize and communicate research about people who have been observed or researched in some way. A persona is depicted as a specific person but is not a real individual; rather, it is synthesized from observations of many people. Each persona represents a significant portion of people in the real world and enables the designer to focus on a manageable and memorable cast of characters, instead of focusing on thousands of individuals. Personas aid designers to create different designs for different kinds of people and to design for a specific somebody, rather than a generic everybody” (Smashing). The goal is to acknowledge our users without diminishing their diversity and complexity and to ensure they are defined by their abilities, aptitudes and attitudes.

*All user personas have been largely adapted from BC Open Textbook Accessibility Toolkit which is licensed under a Creative Commons Attribution 4.0 International License.
Visual

Jacob (Blind)

Jacob is a fourth-year business administration student who is blind and loves learning about new technologies. Jacob is 28 years old and is excited to get his last few classes out of the way so he can start his career. He shares an apartment with his girlfriend.

**Ability:** Blind since birth

**Aptitude:** Skilled technology user

**Attitude:** Digital native, early adopter, persists until he gets it

**Assistive technology:**

- Victor Stream
- Audio recorder (to take notes)
- Refreshable Braille display
- Screen reader (JAWS on his laptop, VoiceOver on his iPhone)

**Format preference:** Electronic text, which he can easily use in JAWS and with VoiceOver; detests PDFs

Adaptive Software Demo: ZoomText, JAWs and Dragon (video of a student using JAWS)

Diana (Gradual loss of vision)

Diana is retraining to be a social service worker after she experienced vision loss and was unable to continue working as a bus driver. She is 48 years old and taking many of her classes online. She lives with her partner of 24 years.

**Ability:** Gradual loss of vision; can read using magnifier easily, but eyes fatigue

**Aptitude:** Intermediate technology user

**Attitude:** Has a routine and likes to stick to it

**Assistive technology:**

- Text-to-Speech software (TextAloud)
- ZoomText
**Format preference:** PDF or electronic text that she can enlarge on her computer or listen to using TextAloud.

Adaptive Software Demo: ZoomText, JAWS and Dragon (video of a student using ZoomText)

Hearing

Stefan (Deaf)

Stefan is an new media web design student who is deaf. He is 23 years old and likes the flexibility of taking online classes. He lives by himself.

**Ability:** Native language is ASL; can speak and read lips

**Aptitude:** Intermediate technology user

**Attitude:** Can be annoyed by barriers to access, such as lack of captions.

**Assistive technology:**

- Captions
- Video chat
- CART (Communication Access Real-Time Transcription) for lectures

**Format preference:** No preference for textbook format, but without captions video is meaningless.

Communication Access Realtime Translation: CART Services for Deaf and Hard-of-Hearing People (Video demonstration of CART).

Violet (Hard-of-hearing)

Violet is 45 years old and lives with her partner Ivanna. She is an avid user of her local public library and especially enjoys accessing their online resources. Violet has a moderate hearing impairment in her left ear.

**Ability:** Hearing loss from an injury.

**Aptitude:** Intermediate technology user; comfortable using a computer and troubleshooting issues, sometimes has difficulty with her tablet.

**Attitude:** Does not get frustrated easily. Will try to figure out technical issues.

**Assistive technology:**

- Captions / Described video
- Volume control for audio content
**Format preference:** No preference for print material, but requires captioning and audio control for audio and video.

**Deaf-blind**

Miyoko

Miyoko is 22 years old and lives with her mother and aunt. She is in the General Arts and Science - College Exploration program at her local college. Miyoko’s classes are both in person and online. She depends heavily on her mother, aunt, and personal support worker to help navigate her surroundings. Miyoko is completely blind with some ability to hear.

**Ability:** Completely blind with some ability to hear since birth.

**Aptitude:** Intermediate technology user.

**Attitude:** Enjoys being able to do things independently, therefore is persistent in understanding / learning new things.

**Assistive technology:**
- Refreshable Braille display
- Screen reader (JAWS)

**Format preference:** Electronic text and captions that can be used easily by JAWS and transformed into Braille. Video: [Screen Reading Technology and Refreshable Braille Displays](#)

**Motor/Mobility**

Trish

Trish is a college student taking university transfer courses. She has a physical disability and uses print books. She is 18 years old and lives with her family.

**Ability:** Brain damage in accident caused paralysis and motor issues

**Aptitude:** Basic computer user, intermediate iPad user

**Attitude:** Generally dependent on family, so enjoys reading and studying independently
**Assistive technology:**
- Motorized wheelchair
- iPad

**Format preference:** e-book formats, such as PDF, that can easily be loaded onto her iPad

**Cognitive/Intellectual**

Ujash (Memory)

Ujash is 50 years old and lives alone. He has recently started taking classes at his local college because he is a lifelong learner. The classes that he is enrolled in are hybrid (both in person and online). Ujash has cognitive disability that affects his memory.

**Ability:** Suffers from short-term memory loss.

**Aptitude:** Intermediate computer user, basic mobile device user.

**Attitude:** Can become frustrated when filling out forms on a web page, especially when trying to correct errors.

**Assistive technology:** Learning software (Kurzweil)

**Format preference:** Prefers clear, clean websites without much distractions. Finds listening and reading helps with his disability.

Ralph (Problem-solving)

Ralph is a first year college student with a blend of online and in-person classes. He went to university for two years but has decided to switch to college for a more hands-on experience. Ralph is 25 years old and lives with his partner Jorge off campus. Ralph has a cognitive disability that affects his problem solving abilities.

**Ability:** Was in a car accident several years ago and suffered from a head injury that affects his memory.

**Aptitude:** Intermediate technology user.
Attitude: Generally easy to adapt to technology but sometimes gets flustered with web errors, broken links, etc.

Assistive technology:
- Learning software
- Screen reader

Format preference: Does not have a preference. Finds that learning software and a screen reader help him with his cognitive disability.

Ann (Attention)

Ann is a mechanical engineering technology student with ADHD, a learning disability that makes it difficult for her to concentrate. She is 20 years old and lives in a dorm on campus with two other female students.

Ability: ADHD, has difficulty concentrating

Aptitude: Intermediate computer user

Attitude: Struggles at times, but very appreciative of how much learning software has helped her

Assistive technology: Learning software (Kurzweil on laptop)

Format preference: Reading and listening at the same time.

Adaptive Software Demo: ZoomText, JAWS and Dragon (Video of student using Kurzweil on a computer)

Mark (Reading, linguistic, and verbal comprehension)

Mark is 17 years old. He is in the motive power technician program at his local college. Mark has a learning disability that was diagnosed in Grade 8. Mark absorbs information best by hearing it and enjoys making and fixing stuff with his hands. Mark can't wait to complete the foundation courses and move into his first apprenticeship placement. He lives at home with his family who shares one computer.

Ability: Difficulty absorbing a lot of information when reading it

Aptitude: Basic technology user

Attitude: Prefers to do things himself, but can get easily frustrated or impatient, especially with technology

Assistive technology: mp3 player
**Format preference:** mp3 so that he can and listen on the go

*Listen to an mp3 recording of a synthetic voice.*

Ramandeep (Math comprehension)

Ramandeep has recently moved to Canada to attend college. It is his first time away from home and he feeling a bit homesick. He is living with a few students that are in the same program as him. Ramandeep is intelligent but he has difficulty with math comprehension.

**Ability:** Intelligent, has difficulty with math.

**Aptitude:** Digital native, especially with mobile devices.

**Attitude:** Learns quickly but has a lot of difficulty understanding math equations.

**Assistive technology / Software / Apps:** Uses Desmos for graphing and websites including Khan Academy and Purplemath.

**Format preference:** n/a

Trevor (Visual comprehension) *

Trevor is an intelligent 18-year-old who is taking general education courses at his local college. He lives at home with his family. He has problems with visual information and recognizing things on web pages.

**Ability:** Autism Spectrum Disorder. Uses larger text and a program that hides everything but the text, so he doesn't get distracted

**Aptitude:** Uses the computer well for games, but doesn't learn new sites easily

**Attitude:** Prefers familiar sites in an established routine

**Assistive Technology:**

- Text preference settings
- Chat and forums
- Power keyboard user

**Format preference:** Text only web sites.
Medical

Sally (Seizures)

Sally is a single mom who is in the Practical Nursing - Alternative delivery program. She lives alone and depends on her mom to help her with child care. Sally suffers from photoepileptic seizures.

**Ability:** Photoepileptic seizures.

**Aptitude:** Intermediate technology user.

**Attitude:** Works hard, is persistent until she understands.

**Assistive technology:** n/a

**Format preference:** Prefers clean webpages with little or no graphics and animations. Requires all visuals to have no strobing, flickering, or flashing effects.
## Appendix B: List of 33 criteria

<table>
<thead>
<tr>
<th>alt-text</th>
<th>text-only / alt-text-functional / alt-text-rich / tool tips</th>
<th>There is no text-only version or the text-only/accessible version contains considerably less content or features. / There are functional images that do not have a textual equivalent. / There are rich images or other visual content that do not have a textual equivalent. // Too-long tooltips</th>
</tr>
</thead>
<tbody>
<tr>
<td>alt-text</td>
<td>alt-text-general</td>
<td>There is non-textual content that does not have a textual equivalent.</td>
</tr>
<tr>
<td>customizable</td>
<td>resizable-text</td>
<td>The page should not prevent a user from resizing text directly in their browser (e.g. either using the browser's zoom function, default browser settings for text size, or web page-specific controls). If a user has to use magnifying software to resize the page, this is a violation.</td>
</tr>
<tr>
<td>help / labels / help-in-context / understandable -links / input-instructions</td>
<td>error-prevention / errors</td>
<td>Context-sensitive help is provided. / The purpose of each link can be determined from the link text alone or from the link text together with its programmatically determined link context, except where the purpose of the link would be ambiguous to users in general. / Labels or instructions are provided when content requires user input.</td>
</tr>
<tr>
<td>help</td>
<td>error-prevention / errors</td>
<td>Error prevention. For Web pages that require the user to submit information, at least one of the following is true:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. Reversible: Submissions are reversible.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Checked: Data entered by the user is checked for input errors and the user is provided an opportunity to correct them.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Confirmed: A mechanism is available for reviewing, confirming, and correcting information before finalizing the submission. // If an input error is automatically detected, the item that is in error is identified and the error is described to the user in text.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If an input error is automatically detected and suggestions for correction are known, then the suggestions are provided to the user, unless it would jeopardize the security or purpose of the content.</td>
</tr>
<tr>
<td>input</td>
<td>keyboard / keyboard-trap / focus-indicated</td>
<td>There is functionality that cannot be accessed via the use of the keyboard. / If keyboard focus can be moved to a component of the page using a keyboard interface, then focus can be moved away from that component using only a keyboard interface, and, if it requires more than unmodified arrow or tab keys or other standard exit methods, the user is advised of the method for moving focus away. // Any keyboard operable user interface has a mode of operation where the keyboard focus indicator is visible.</td>
</tr>
<tr>
<td>labels</td>
<td>headings</td>
<td>Headings and labels describe topic or purpose.</td>
</tr>
<tr>
<td>Section headings are used to organize the content.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>senses</strong>&lt;br&gt;senses</td>
<td>There are instructions for understanding or operating content that rely solely on sensory characteristics (e.g. shape, size, visual location, orientation, or sound.)</td>
<td></td>
</tr>
<tr>
<td><strong>senses</strong>&lt;br&gt;colour</td>
<td>There is content where colour is used as the only visual means of conveying information, indicating an action, prompting a response, or distinguishing a visual element.</td>
<td></td>
</tr>
<tr>
<td><strong>senses</strong>&lt;br&gt;contrast</td>
<td>The visual presentation of text and images of text has a contrast ratio of at least 4.5:1, except for the following... (AA)&lt;br&gt;The visual presentation of text and images of text has a contrast ratio of at least 7:1, except for the following... (AAA)</td>
<td></td>
</tr>
<tr>
<td><strong>structure</strong>&lt;br&gt;skip-links</td>
<td>A mechanism is available to bypass blocks of content that are repeated on multiple Web pages.</td>
<td></td>
</tr>
<tr>
<td><strong>structure</strong>&lt;br&gt;focus-order</td>
<td>If a Web page can be navigated sequentially and the navigation sequences affect meaning or operation, focusable components receive focus in an order that preserves meaning and operability.</td>
<td></td>
</tr>
<tr>
<td><strong>structure</strong>&lt;br&gt;tables / sequence</td>
<td>There is information in a table but the columns and rows cannot be identified by screen readers. / When the sequence in which content is presented affects its meaning, a correct reading sequence can be programmatically determined.</td>
<td></td>
</tr>
<tr>
<td><strong>structure</strong>&lt;br&gt;frames</td>
<td>The page uses frames, which can be disorienting for non-visual users.</td>
<td></td>
</tr>
<tr>
<td><strong>structure</strong>&lt;br&gt;structure</td>
<td>Information, structure, and relationships can be programmatically determined.</td>
<td></td>
</tr>
<tr>
<td><strong>structure</strong>&lt;br&gt;location-in-site</td>
<td>Information about the user's location within a set of Web pages is available.</td>
<td></td>
</tr>
<tr>
<td><strong>structure</strong>&lt;br&gt;multiple-ways</td>
<td>More than one way is available to locate a Web page within a set of Web pages except where the Web Page is the result of, or a step in, a process.</td>
<td></td>
</tr>
<tr>
<td><strong>structure</strong>&lt;br&gt;consistent-navigation</td>
<td>Navigational mechanisms that are repeated on multiple Web pages within a set of Web pages occur in the same relative order each time they are repeated, unless a change is initiated by the user.</td>
<td></td>
</tr>
<tr>
<td><strong>structure</strong>&lt;br&gt;clustered-links</td>
<td>Links/buttons that are too small or too close to each other</td>
<td></td>
</tr>
<tr>
<td><strong>system-behaviour</strong>&lt;br&gt;pop-ups / interruptions</td>
<td>The site uses pop-up windows. The page contains HTML or JavaScript code that opens new browser windows either when the user activates links/buttons or, even worse, after the page has been loaded. The page has been opened within a new browser window but the usual browser controls (address bar, back, next, refresh buttons, ...) are missing. / The page includes interruptions that cannot be postponed or suppressed by the user, except in the case of emergencies.</td>
<td></td>
</tr>
<tr>
<td>system-behaviour</td>
<td>dynamic-content</td>
<td>Dynamic page content (things that move, blink, scroll, auto-update)</td>
</tr>
<tr>
<td>------------------</td>
<td>----------------</td>
<td>------------------------------------------------------------------</td>
</tr>
<tr>
<td>system-behaviour</td>
<td>authentication</td>
<td>When an authenticated session expires, the user can continue the activity without loss of data after re-authenticating.</td>
</tr>
<tr>
<td>zzz-to-sort</td>
<td>liquid-layout / long-lines</td>
<td>Page layout not liquid / The page contains text lines that are too long for the user's field of vision. The page contains a form whose controls are spread on a wide region of the page and they are arranged on more than one visual column.</td>
</tr>
<tr>
<td>zzz-to-sort</td>
<td>cascading-menus</td>
<td>Cascading menus/dynamic Javascript menus</td>
</tr>
<tr>
<td>zzz-to-sort</td>
<td>video-flicker</td>
<td>Video flickering, no warning.</td>
</tr>
<tr>
<td>zzz-to-sort</td>
<td>lacks-icons</td>
<td>The page lacks icons associated to links and other content of the page. The page has also too little colors that would help people understand better how the page is organized and what kind of contents are shown. Typically text-only pages have this kind of defect.</td>
</tr>
<tr>
<td>structure</td>
<td>complex-structure</td>
<td>Complex site structure</td>
</tr>
<tr>
<td>zzz-to-sort</td>
<td>language-page</td>
<td>The default human language of each Web page can be programmatically determined.</td>
</tr>
<tr>
<td>zzz-to-sort</td>
<td>moving-content</td>
<td>Non-video moving content (e.g. running text, animated gifs, etc.) with no textual equivalent. User cannot perceive that the content has changed.</td>
</tr>
<tr>
<td>zzz-to-sort</td>
<td>image-maps</td>
<td>Image maps</td>
</tr>
<tr>
<td>zzz-to-sort</td>
<td>rich-images-background</td>
<td>Rich or functional images embedded in the background</td>
</tr>
<tr>
<td>zzz-to-sort</td>
<td>change-of-context</td>
<td>When any component receives focus, it does not initiate a change of context. Changing the setting of any user interface component does not automatically cause a change of context unless the user has been advised of the behavior before using the component.</td>
</tr>
</tbody>
</table>
Appendix C: Steering Committee Survey (Modules 1-3)

The primary purpose of the Library eResources Accessibility Project (LEAP) is to assist Ontario college libraries in upholding accessibility best practices and becoming compliant with the requirements of the Accessibility for Ontarians with Disabilities Act (AODA), particularly the January 1, 2020 deadline for ensuring the accessibility of electronic resources (IASR, 2011, s. 18(3)). This project is currently in testing phase so that we can review and evaluate the modules currently being developed. Modules are intended for institutional use by any Ontario library staff member, regardless of technical knowledge. Instructions were developed to be easy to understand and technology selected for testing is, wherever possible, widely and freely available in the form of browser extensions.

This survey is designed to evaluate the usefulness of these testing modules which are currently in draft format as Google Forms and will ultimately undergo a redesign and be housed in a dedicated website with links to additional tools and information about this project.

The project team would like to ask you to:
1. Conduct testing with all 3 modules and track time spent completing each module
2. Test each module using the same database: Academic Search Premier/Complete
3. Complete the following questionnaire to provide your feedback once you have conducted the testing of all the modules.

1. Preliminary LEAP analysis resulted in the development of 33 accessibility criteria which were applicable to eresources. Do you have any input with regard to how these criteria have been broken down into 4 individual modules?
2. Each module was intended to have a simple and identical layout and similar length. Would you change anything about how each module appears?
3. Instructional content does not presume technical knowledge. Did you find instructions easy to understand and the tests straightforward to execute? Do they offer enough detail?
4. Most technology used in the testing process is widely available and free. Please provide your thoughts about the extension and software choices.
5. Have you used similar technology before? Please describe your comfort levels using these technologies.
6. How and when would you use this tool?
7. How would you integrate this tool into your regular workflow?
8. How much time did it take to complete each module?
9. Did you have a preference for how the questions were formatted in terms of ease of understanding and use?
10. Did we forget to ask you something important? Please provide further comments:
Appendix D: Steering Committee Survey
(Module 4)

The primary purpose of the Library eResources Accessibility Project (LEAP) is to assist Ontario college libraries in upholding accessibility best practices and becoming compliant with the requirements of the Accessibility for Ontarians with Disabilities Act (AODA), particularly the January 1, 2020 deadline for ensuring the accessibility of electronic resources (IASR, 2011, s. 18(3)).

This project is currently in testing phase so that we can review and evaluate the modules currently being developed. Modules are intended for institutional use by any Ontario library staff member, regardless of technical knowledge. Instructions were developed to be easy to understand and technology selected for testing is, wherever possible, widely and freely available in the form of browser extensions.

This survey is designed to evaluate the usefulness of these testing modules which are currently in draft format as Google Forms and will ultimately undergo a redesign and be housed in a dedicated website with links to additional tools and information about this project.

The project team would like to ask you to:

A. Conduct testing with the final 4th module and track time spent completing it. This module will be distributed alongside this survey as a WORD document.
B. Please test this module using the same database: Academic Search Premier/Complete
C. Complete the following questionnaire to provide your feedback once you have conducted the testing this module.

1. Preliminary LEAP analysis resulted in the development of 33 accessibility criteria which were applicable to eresources. Do you have any input with regard to how this criteria has been broken down into individual modules: interface appearance, navigation, structure & content?
2. Each module was intended to have a simple and identical layout and to be similar in length. First three modules you tested were in a Google Form format and the 4th as a WORD document. Would you change anything about how each module appears? Do you find it useful to have access to both formats?
3. Instructional content does not presume technical knowledge. Did you find the instructions easy to understand and the tests straightforward to execute? Do they offer enough detail?
4. Most technology used in the testing process is widely available and free. Please provide your thoughts about the extension and software choices.
5. Have you used similar technology before? Please describe your comfort levels using these technologies.
6. How much time did it take to complete the 4th module? Please indicate how long module 4 took, along with some context for the work you did (ie. software access & checking 3 PDFs) etc.

7. Do you have a preference for how the questions were formatted in terms of ease of understanding and use? (i.e. multiple choice, checkboxes, long answer, lengthy descriptions of cause/failure/effect/fix, etc.)

8. Did we forget to ask you something important? Please provide further comments:
Appendix E: Advisory Group library database testing

**Audience:** Advisory group including students with print disabilities who may use assistive technologies to access eresources.

**Timeline:** 1-2 week turnaround time to submit responses and comments, plus a conference call to discuss.

**Purpose:** To bring clarity to a number of criteria which relies on human judgement for accessibility assessment or lacks formal standards for evaluation.

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About the project

The primary purpose of the Library eResources Accessibility Project (LEAP) is to assist Ontario college libraries in upholding accessibility best practices and becoming compliant with the requirements of the Accessibility for Ontarians with Disabilities Act (AODA), particularly the January 1, 2020 deadline for ensuring the accessibility of electronic resources (IASR, 2011, s. 18(3)).

The Library eResources Accessibility Project is designed to:

- Identify accessibility standards for evaluating eresources according to our research findings, and as recommended by other existing best practices.
- Create a self-audit tool for evaluating eresources based on those standards.
- Recommend a way for colleges to integrate the evaluation process into their local workflows.
- Recommend a way that the colleges can pool their resources and share completed evaluations with each other.
- Build awareness and capacity among college library staff regarding accessibility.

What the research team needs from you...

From your experience navigating academic library databases, we are asking you to please address a series of questions to help the project team develop a better understanding of critical challenges and issues encountered when accessing e-resources, with a focus on the use of assistive technologies. Please address questions that apply to you directly. When questions do not apply to you, please leave your responses blank.

Please submit your responses by **5pm on February 8th**. Add your responses directly into this Word Document following each question. If you would like to submit them in a different format, please let us know about your preferences.
When all of the responses have been received, the project team will schedule a conference call to discuss some of these criteria over the phone with you, and ask any additional follow-up questions.

Tell us about yourself

1. Please share what assistive technologies, if any, you use to access electronic resources such as library databases.
2. Please let us know how long you have relied on assistive technologies to access web content.
3. How do you conduct library research (for articles or books) online? Please describe how you typically use the library website or databases for your research, including any examples of specific databases used
   - Is there a main search box on your library homepage that you use?
   - Or are you more inclined to select a specific library database (such as Academic Search Premier)?
4. Please describe what devices you use to access databases. For example: laptop, desktop, ipad, phone.

Question 1: Zooming in
If you have ever used text magnifiers, please comment on what type of technology you used and help the project team understand any challenges you encountered when using it in conjunction with any academic database. Our current assessment checks for issues regarding navigation at 150% and for issues regarding resolution at 200% - 300%. Do you think this is a sufficient evaluation?

Question 2: Change of context
Library databases can sometimes behave in unexpected ways with pop-up notices or sudden change of focus unprompted by the user; this accessibility criteria is referred to as change of context. Please share your real life experiences related to change of context and how you bypass such obstacles.

Question 3: Error reports and other forms
What are the biggest obstacles you have encountered when submitting forms such as error reports or other forms? Please let us know if obstacles were based on format, presentation, accessibility, etc.
Question 4: Website language
How do you establish which human language is used in an article database?
How do you establish which human language is used in a specific article within a library database?

Question 5: Clustered links
Sometimes links may appear as a grouping and if they are too close to one another, they could be difficult to select. There are no known standards for how far apart links should be from one another to be usable. From your experience, could you comment on this issue?

Question 6: Navigation
What tools or page elements improve the quality of your navigation through an electronic resource? Please be as specific as you can.

Question 7: PDF
In your view what should be the minimal requirements of an accessible PDF?

Question 8: Inaccessible PDFs
The quality and accessibility of PDF articles within databases vary. Have you ever encountered a PDF in your library’s databases that was not accessible?

If so, please describe your next steps: did you request it in an accessible format? Did you find a different resource to use instead, etc.

Question 9: Multimedia
Aside from captioning, what is your desired accessibility criteria for multimedia content found in databases? Please be specific: video description, transcripts, etc.

Question 10: Structure
What do you consider a well structured database interface? If you were a publisher designing an electronic resource, how would you structure the landing page? How would you structure the article page?
Thank you!

Thank you very much for taking the time to complete this questionnaire. Please submit all responses to Corinne Abba at the following address: cabba@georgebrown.ca.

Appendix E: Tool Options & Costs

Option 1: Google Forms / Spreadsheets / Drive

During the testing period, three modules were created using google forms in order to present content in a more user-friendly and interactive format. Based on the feedback received, the modular format provided a positive user experience and made the testing process easy to navigate. Each time a test was completed responses could be collected and exported using a spreadsheet which will dynamically update as more people complete a module.

A process and a schedule for testing databases could be established using Google forms with reports generated as Google spreadsheets. One column would list the criteria, and another column could be used to assign a rating for how a database performed using Module 1, 2, 3 and 4 (e.g. pass/fail). Spreadsheets would be stored in a Google Drive so they can be viewed by all evaluators and can be updated in real time.

### Pros
- Initial development requires minimal labour
- All components are freely available
- Could be established in a fairly short timeline
- Google has version control features, can tell when someone else is editing a file

### Cons
- Technology reliant
- Potential privacy issues for any information hosted on external servers
- Managing access/edit permissions could be cumbersome, may not be possible to achieve desired outcome
- Would require considerable maintenance to ensure files/folders stay organized
- Work cannot be saved or paused
- Big spreadsheets can take time to load

Option 2: Excel Spreadsheets / Repository

A template could be created using Excel spreadsheets. One column would list the criteria, and another column would be used to assign a rating (e.g. yes/no). Hyperlinks could also be embedded in the spreadsheet that can lead to a Google document or website with instructions on how to evaluate each criterion. Alternatively, instructions could be provided in a Word document (no direct linkage). Spreadsheets would be uploaded to a central repository (potentially Vital or O3 forums, but would require further investigation).
**Pros**

- Initial development requires minimal to moderate labour
- All or most components are easily available
- Could be established in a fairly short timeline
- O3 has version control features (“reserve document”, version history)
- Capacity to save results locally and share final reports via a repository
- Completely free

**Cons**

- Instructions are not embedded in tool, so evaluation process is not easy or intuitive
- Participants must exert considerable effort to create quality evaluations
- Would require frequent uploading and downloading of files, versioning could become problematic
- Repository would need to have fine-grained access/edit permissions that could be easily assigned, may not be available
- Potential privacy issues for any information hosted on external servers
- Could require some financial commitment depending on repository choice

**Option 3: Custom Drupal Site**

A custom Drupal can be developed (e.g. using Views and other modules), which would provide both an interactive interface and a database. The interface would guide evaluators through the evaluation process step-by-step. Instructions for evaluating each criterion would be directly embedded in the interface. The results would be stored in a database that shows all previously completed templates.

**Pros**

- Step-by-step instructions are embedded in the interface, making the evaluation process easy and especially convenient for new evaluators
- Step-by-step instructions also facilitate higher quality evaluations
- Could be custom-built to meet all/most of our needs (e.g. access/edit permissions, versioning)
- Would raise the profile of the Ontario college libraries, could potentially be offered as a service to other libraries e.g. OCUL
- Would be more sustainable in the long run, function better, less reliant on 3rd party upgrades which can result in technical issues, even if temporary
- Privacy issues related to external third

**Cons**

- Would require initial setup costs as well as some ongoing maintenance costs (though maintenance costs would likely be low)
- Would require hiring a developer ($10,000 to $30,000 depending on the complexity of a project) or be built by someone with some existing expertise with assistance of consultants or developers
- Would require a longer timeline to develop and launch
party servers may be avoided if work is housed locally in Canada
- Capacity to save work, pause and complete modules

**Option 4: Libguide / Google Forms**

Since the Google modules received positive responses in the testing phase, they should not be ruled out as an affordable option although there are a few feature limitations which were encountered by the research team and became evident through Steering Committee feedback. If a Drupal site is out of scope for this project, then the modules built in Google Forms could be embedded in a libguide and responses submitted can be converted to Google excel which would update dynamically. A summary of responses could be emailed to the person completing a module for their own records as well as populate a spreadsheet for collective access.

**Pros**
- Very easy to create and maintain
- A familiar platform for library staff
- Can be embedded into a Libguide pretty easily
- Free of charge if there is a hosting college already subscribing
- Libguides are widely available and many staff already have competencies in maintenance

**Cons**
- Third party software, lack of control and customization to allow library staff to save work and return to it
- Some institutions are starting to move away from libguides investigating alternative options
- Libguides cost money unless an Ontario college can host using their existing platform
- Libguides are frequently updated so any updates could cause additional work
- Some institutions are starting to move away from libguides (ie. Hugo) so long term implications are a consideration
- Potential privacy issues for any information hosted on external servers
References


