

NNELS



Accessibility Report for PretNumerique

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Conducted by the [National Network for Equitable Library Service \(NNELS\)](#)

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About NNELS

The National Network for Equitable Library Service (NNELS) is a digital public library of ebooks for Canadians with print disabilities,¹ and an advocate for an accessible and equitable reading ecosystem for Canadians with print disabilities. NNELS supports principles of openness, inclusion, and choice. NNELS is hosted by the BC Libraries Cooperative, a community service not-for-profit cooperative and a national leader in information and technology services.

Our team of Accessibility Testers has expert knowledge in the areas of accessibility testing, analysis, software development, and leadership. The team works to educate and advise publishers, technology vendors, and public libraries on best practices for accessibility. Our testers have lived experience with a range of print disabilities, including blindness, low vision, and learning disabilities.

¹ Print disabilities are defined by Canada's Copyright Act and include visual, mobility, or comprehension impairments such as dyslexia.

Introduction

PretNumerique is available as a website and a mobile application. It provides access to various types of content including ebooks and audiobooks using local libraries, and the available content may differ by region. For this report, our testers used the Montreal Public Library as well as Bibliothèque et Archives nationales du Québec (BAnQ). Our team was provided with test accounts through both of these libraries.

Our testers used screen-reading and magnification software to assess the usability of the apps and website across supported platforms. A complete list of all the software and operating systems used in this assessment can be found in the Systems and Assistive Technology section of this report. The objective of this assessment is to determine the usability experience of readers with print disabilities,² and to what extent they can access audiobooks and ebooks through their local public library effectively and efficiently. It is important that readers with print disabilities can choose the reading systems that offer the accessibility features they require.

Both the French and English website and mobile applications were tested and yielded comparable experiences. The results show that testers encountered moderate accessibility barriers, including unlabeled or mislabeled controls and inconsistent navigation. The website was found to be the most accessible option, with significant changes made to benefit screen-reader users. This report highlights the accessibility barriers of the PretNumerique mobile app and website, explains the barriers that these issues pose and why they are problematic, and advances some recommendations to enhance the usability experience for readers with print disabilities.

Introduction to Assistive Technology

All mainstream operating systems include built-in screen-readers (Narrator on Windows, VoiceOver on Apple devices, and TalkBack on Android) that read the contents of the screen out loud, allowing users with visual disabilities to browse apps and websites, send and receive texts and emails, and accomplish many other tasks with ease. Keyboard commands and custom touch gestures provide a flexible way for a user to find and interact with the controls on-screen. Windows also has alternative screen-reading software available, most notably a commercial option called Job Access with Speech (JAWS) and a free and open-source option called Non-Visual Desktop Access (NVDA). The text spoken by a screen-reader can be sent to a refreshable braille device. Mainstream operating systems are also equipped with user interface magnification, large text options, and high-contrast viewing mode to assist people with low vision.

² Print disabilities are defined by Canada's Copyright Act and include visual, mobility, or comprehension impairments such as dyslexia.

To ensure usability and accessibility of an application by people with print disabilities, all functions and controls must be accessible using assistive technologies. The DAISY Consortium explains that the basic assumption of accessibility evaluations is that reading systems “should support reading with eyes, ears, and fingers.” (DAISY Consortium, 2017). It should be possible for users to read the content of the document by:

- Reading the text with screen-readers or self-voicing text to speech (TTS) applications
- Adjusting the display including font size, alignment, and color contrast, or combination of some or all these options
- Reading the text with a refreshable braille display
- Reading with assistive technologies designed for persons with dyslexia or other disabilities
- Reading with the app’s built-in read aloud functions

Accessibility Performance and Recommendations

In the following sections we dive deeper into specific accessibility issues of the different features of the PretNumerique apps and website. Below you will find the testing results and their related recommendations as they pertain to:

- Signing in
- Discovering and managing content
- Bookshelf management
- Audiobook player usability
- Ebook reader usability
- Visual adjustments/customization

We highlight some of the problematic issues as they relate to the different parts of the application in each of the platforms tested. The **Development Recommendations** sections contain suggestions for improving the interface on each platform.

iOS

The iOS version was found to have minor accessibility barriers for screen-reader users, including challenges in searching for books and navigating search results, as well as interacting with borrowed books. There were also some buttons which would benefit from clearer labeling. Some visual adjustment and customization settings are present, but these could be expanded to further enhance accessibility.

- Tested iOS Version: 14.2
- Tested App Version: 2.2
- Screen-reader: VoiceOver

Signing In

No issues were encountered adding a library catalogue to the app; however, other users may find this process confusing because the app does not immediately ask them to add a library, and the option to do so is not immediately available on the home screen.

Discovering and Managing Books

Several issues were encountered when searching for and browsing titles:

- When accessing a library's catalogue, categories such as *recent releases* do not expose their titles to VoiceOver until the *see all* button is pressed.
- Screen-reader users noted that VoiceOver did not announce which search filters were selected, and there was no way to clear or reset them.
- VoiceOver reads each book entry as separate controls—title, author, and availability status. Grouping these controls together would allow for more efficient navigation of book lists when using left or right swipe gestures to navigate from one control to the next. Additionally, this control should be given a role of button so that users know it can be tapped or clicked.
- After opening a book from search results, then going back to the results screen, the text field to perform a search is scrolled off the screen. The user must swipe down (with three fingers if using VoiceOver) to reveal the search box again.

Bookshelf Management

Titles in the bookshelf are not announced by VoiceOver, which presents a significant problem. As one tester described the experience:

“According to VoiceOver, the bookshelf tab does not have names, authors, total elapsed time, or any other information about each book besides its expiration date. At present, the control for each book simply reads “21 days”. Even tapping on one of these entries does not reveal the title on the next screen. I found that I was able to long-press the “21 days” controls, choose “info”, and find the title this way. I can then play the book directly from the info screen.”

Similar problems were reported when navigating the *recently read* section of the app. Additionally, screen-reader users reported that they could not find or access the loans section of the app in order to view the titles they had checked out on other devices.

Audiobooks

The audio book player worked well for all testers, though some minor labelling issues are noted below:

- The media controls have labels such as play.circle, pause.circle, goforward and gobackward. Their meaning is still clear, but better labels should be used for increased readability and clarity for all users, such as: play, pause, next_chapter, and previous_chapter.
- The button to close the sleep timer and speed menus is not labelled.
- The button to access table of contents and bookmarks has a label of “list”. A label such as “contents and bookmarks” would provide more clarity.

Ebooks

The ebook player is screen-reader accessible, but there are a few barriers. Screen-reader users found that the book could not be read continuously; instead, the next page button needed to be pressed. There are two switches both called *scroll mode* which appear to have no effect on the book view. Moving through pages one at a time can be cumbersome, and having to interact with the device to read each new page disrupts the non-visual reading process.

Additionally, there are minor labelling issues in the reader that should be corrected for clarity:

- The next and previous page buttons are spoken as “reader_forward_a11y_label” and “reader_backward_a11y_label”, respectively. We recommend clear names such as “next_page” and “previous_page”.
- The button to open the table of contents and bookmarks is labelled “drag”.

Visual Adjustment

The iOS app has a wide range of settings to adjust the text appearance in the ebook viewer. This includes several fonts and styles, font size, and spacing adjustment for character, word, and line.

Testers noted that there are no settings for text, highlight, or background colour, no way to remove all styling from book text, and hyphenation could not be turned off. This presents barriers for users with low vision or learning disabilities—such as dyslexia—who require as many colour and contrast settings as possible to adapt the text to their needs. For example, many people with low vision find it helpful to use a custom colour theme such as yellow text on a blue background.

Development Recommendations

- Clearer labels in the ebook and audiobook player screens

- In catalogue booklists, group the controls for each title together, or place the title under a heading for quicker screen-reader navigation.
- Indicate which search filters are selected when filtering results
- Allow ebooks to scroll continuously

Android

The Android version was found to have minor accessibility barriers for screen-reader users, including a consistent loss of focus³ while using the ebook viewer and a small number of unlabelled controls. The app has some visual adjustment settings, but lacks a way to adjust text spacing and has limited colour themes available. Coupled with the lack of a read aloud feature, this creates a negative reading experience for many users with print disabilities.

- Tested Android Version: 10
- Tested App Version: 1.0.16
- Screen-reader: TalkBack (Android's built-in screen-reader)

Signing In

TalkBack repeats the words “end of text field” as every character is entered into the account and password fields. Some users may find this confusing and interpret it as a sign that the text field is not accepting their input, and it is certainly unhelpful and repetitive. However, it is possible to review the text that has been typed into each field, and the sign-in process was otherwise accessible for all testers.

Discovering and Managing Books

After a subsection such as the Montreal catalogue is opened, the navigation tabs disappear from the bottom of the screen. This makes it harder to jump between sections of the app, sometimes requiring several presses of the back button before the tabs will reappear.

When searching for books, it is not possible to locate the button to filter search results by genre, content type, etc. using TalkBack.

Search results and catalogue entries are labelled well, with the title, author and availability status all in a single control.

Bookshelf Management

Testers using TalkBack were not able to find either the loans or holds list within the Android app. Totally blind testers did not know whether this option is available on Android. For these users, the experience was as if the button is invisible to TalkBack.

³ Screen readers “focus” on focusable elements, like buttons, search fields, controls, etc., as the user interacts with the app via their device.

The *my books* tab reads well, with each book announcing its title, author, and remaining loan time. A long press on a book title brought up a menu with options pertaining to that book, including delete and return. Although this works well, it may not be intuitive for all users.

Audiobooks

Testers evaluated the accessibility of the audiobook player, including setting and returning to bookmarks, accessing the table of contents, and changing playback settings. The audiobook player was found to be intuitive and simple, though with a few mislabelled controls:

- The play controls have the word “btn” in all the accessibility labels, causing TalkBack to be unnecessarily verbose when reading them.
- When a book is playing, the play button does not switch its label to pause, as most play buttons would do.
- The elapsed and remaining time counters both accessible to screen readers, but they are not labelled, so only the numbers are spoken. Their purpose is obvious while a book is playing, as one is counting up and the other down, but for clarity we recommend labeling them.

Ebooks

The ebook reader defaults to full-screen view until the screen is tapped, which could confuse users who are not familiar with this behavior. Once revealed, controls are accessible with clear labels. TalkBack uses a two-finger swipe to scroll and turn pages, and this was found to work in the reader view whether the controls are visible or not.

TalkBack users noted that they would sometimes lose focus while swiping right through the contents of each page, resulting in TalkBack jumping to a different part of the screen. This behavior was also observed while using continuous reading mode. It is important to note that this can create confusion for some users.

Visual Adjustment

The Android app includes a range of visual adjustment settings for the ebook viewer. A selection of fonts is available, including Accessible DFA; and visual themes are available, although their buttons are not labelled and TalkBack cannot read their names. Even though these buttons are most helpful for users with some vision, it is important to label all controls so that low-vision users relying on a combination of screen-reading and visual adjustment are still able to use them effectively.

Testers noted that while the Android app included settings not found on iOS, there was no way to adjust character, word, or line spacing, and the selection of themes was quite limited. This could negatively impact readability for users with low-vision, dyslexia or other learning disabilities.

Development Recommendations

- Add bottom tabs to all catalogue screens for easier navigation

- If it is possible to access loans and holds, ensure these options are accessible with TalkBack
 - Fix labels in audiobook player
 - Troubleshoot TalkBack's loss of focus in the ebook reader
 - Add a read aloud option, especially if the TalkBack issue cannot be solved
 - If TalkBack is loaded, do not hide ebook reading controls
 - Add settings for character, word, and line spacing
 - Label the names of visual themes so TalkBack can read them
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Web

The website was tested across Windows and MacOS using a variety of assistive technology and browser combinations. Accessibility appears to have been part of the design process, and it has resulted in a more positive user experience than the mobile apps. The page structure facilitates navigation and readability, including the addition of landmarks, headings, and other HTML markup. Testers noted several remaining accessibility barriers, including mislabelled controls and inconsistent navigation in the audio and ebook viewers; verbose and unhelpful announcements from the ad carousel; and the need for additional visual adjustment settings.

Signing In

The sign-in process was accessible to all testers, though it was noted that the login button was difficult to find. Testers noted that while most parts of the interface were available in French and English, the sign-in page was only in French.

Discovering and Managing Books

All testers reported success with searching, reviewing results, and filtering results. Each title is under a separate level 3 heading, allowing a screen-reader user to move quickly from one to the next. The format (ebook or audiobook) is under a separate level 4 heading underneath it.

The search filters are well-labelled and easy to find, and the process is intuitive. Users also reported success with managing and returning loans.

Borrowing a book causes a page reload so that the user can enter their e-mail address. Several testers described this process as cumbersome. They recommended an option that would automatically open the book without sending a link, or a small pop-up on the existing page to ask for e-mail address.

Audiobooks

Audiobooks can be read directly on the website using an integrated player. Several users noticed that the playback controls did not have a text label, though they do have a title attribute that displays their function (such as play, back, and forward) in a tooltip. Some screen-readers have trouble picking up on this, so a proper label would still make this player more accessible. Keyboard shortcuts would also make this player easier to use.

Testers also reported that the position and volume sliders were not accessible with the keyboard. They can be reached with the tab key but adjusting them with the arrow keys has no effect. To help with this, native sliders could be adjusted with the arrows, page up / down, and home / end keys. Some web-based media players also include global hotkeys, such as j, k and l to skip backward, play/pause, and skip forward; and the up and down arrow keys for adjusting volume. Many non-disabled users also find these features convenient for eyes-free playback control.

Ebooks

The website's integrated ebook reader is accessible with some compromises.

- Our testers were not able to switch the reader to single-page view, so it continued to show two separate frames with two separate pages. It would be useful if a single page could be shown at a time, or the text could be presented in a continuous scrolling view. This would help low-vision and screen-reader users respectively.
- One low-vision tester remarked that "The placement of icons for *read aloud* and *enlarge* could be placed more towards the centre of the screen. They can be "lost" to anyone using screen magnification."
- The read aloud function has an inaccessible speed control. Some testers were able to adjust speed successfully; others were not.
- More than one tester reported that the text of ebooks was sometimes invisible to screen-readers. This could not be reproduced reliably, but it seemed to happen when moving from one page to the next.
- The menu button at the beginning of the page is not labelled.
- When searching within a book, it is unclear where each search result appears in context. It would be helpful to have a page number after each result to give the reader a sense of the position of the result in the book.

Visual Adjustment

- Testers noted that font size could be changed, but that the slider was not accessible to NVDA.
- There are two font face options, including a dyslexic font.
- Font and background colour cannot be adjusted independently, only selected from the available themes.
- Page view cannot be changed from dual-page to single, or to a continuous scrolling view. This would help low-vision users who would prefer to see one page at a time.

Miscellaneous

Ad carousel: Screen-reader users noted that the ad carousel was problematic for multiple reasons: The text being announced is not informative: It does not tell the user it is an ad, and consists of a long URL with no information about where it goes. The carousel also announces text to the screen-reader even when it doesn't have focus, which interferes with navigation. Additionally, the carousel's navigation controls are not labelled.

Heading hierarchy: There are instances where heading hierarchy is incorrect. A level 2 heading should always be under a level 1 heading, and a level 3 heading should always be under a level 2 heading.

Development Recommendations

- Label the controls in the audiobook player and resolve keyboard navigation of position and volume sliders
- Add more visual adjustment to ebook reader, including page layout
- Fix accessibility of settings and reading speed in the ebook viewer
- Change the ad carousel so that it does not announce confusing text to screen-readers.

Conclusion

The PretNumerique apps and website are somewhat accessible, and provide a range of visual adjustment settings, but these settings are not consistent across platforms and many users with low vision or learning disabilities would find the experience lacking. With a screen-reader, sections of the mobile applications range from confusing to unusable, which could frustrate less experienced technology users. The main pages of the website are quite intuitive and accessible, though the audio and ebook readers have minor accessibility barriers and lack some of the customization options available in the mobile apps. Implementing the development recommendations for each platform would create a much more intuitive experience covering a wide range of accessibility needs.

Systems and Assistive Technology

- Operating Systems
 - Windows 10 (20H2)
 - Mac OS 10.15 (Catalina)
 - iOS 14.1 and 14.2
 - Android 10
- Mobile Applications
 - PretNumerique 2.2 (iOS)
 - PretNumerique 1.0.16 (Android)
- Browsers
 - Chrome 86 through 88
 - Firefox 81 through 83
 - Safari 14
- Screen-readers
 - NVDA 2020.3 (Windows)
 - JAWS 2021 (Windows)
 - VoiceOver (MacOS)
 - VoiceOver Touch (iOS)
 - TalkBack (Android)

- Magnification
 - Magnifier (Windows)
 - ZoomText 2020 (Windows)
 - Zoom (iOS)

Contributors

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