

Usability Test Results Report

Created for and in partnership with the Hennepin County Library

**Team High Steaks: Bailey Arman, Alexandra Finley, Emily Raper, and
Brent Tester**

April 30, 2020

	1
Executive Summary	2
Introduction	2
Methods	3
Results	3
Discussion	4
Recommendations	5
Introduction	5
Test Goals and Research Questions	6
Participants	6
Methods	8
Background Questionnaire	8
Tasks and Scenarios with Post-Task Questions	8
Debriefing Interview with Product Reaction Cards	9
Results	9
Quantitative Results	9
Qualitative Results	12
Discussion of Findings	13
Ambiguous, Vague, and/or Inconsistent Categories	13
A Lack of an “eBooks” Category	13
Intuitive Options, Successful Tasks	15
Bridging the Themes	16
Recommendations	16
Major	16
Medium	17
Minor	18
Back Matter	19
Appendix A: Data Worksheets	19
Appendix B: Sample RStudio Code	29

Executive Summary

Introduction

In partnership with the Hennepin County Library (HCL), a public library system serving the city of Minneapolis and surrounding communities, an online Zoom usability test was conducted with the goal of testing the browse drop-down menu. Chip Gehring, a representative of HCL, highlighted two areas of focus: the drop-down browse menu and the locations page. Our team chose to analyze the former due to the fact that HCL “[has] not made any changes to the wording of the Browse menu since we redesigned the website in 2014” (Client Project Form). As such, our team believes that the results of the usability test offer valuable current feedback towards an efficient redesign of HCL’s Browse menu.

Our research question asked whether a user’s expectation of what a “browse” menu offers matches the reality of the Hennepin County Library’s browse drop-down menu. In short, does the language, order, and length of the menu reflect the user’s expectations? All four scenarios and tasks in the usability test were designed for four participants in order to best extend and analyze these research questions. It should be noted that all users were contacted within the WRIT 4501 Usability and Human Factors in Technical Communication course with the exception of one participant.

Methods

Methods employed include: a background questionnaire; four scenarios and tasks, including a card sort; post-task questions; a debriefing interview; and product reaction cards.

The background questionnaire was filled out prior to testing, and was distributed via a google form. It gathered demographic data like age and gender, as well as library-specific data, with questions like “how often do you visit your library?” and “what resources do you use at the library?”

Three scenarios required participants to use the browse tab (and not the search bar) to locate resources at the library, including DVDs for children (Scenario 2), books in languages other than English (S3), and ebooks (S4). The first scenario was a closed card sort, and required participants to sort terms into the three main HCL drop-down menus (Browse, Programs and Services, and About the Library) without having seen the website first. There were 36 terms total (including things like new titles, books for teens, events, art at the library, news, awards, and so on and so forth). The card sort was facilitated by the website [usabilitytest.com](https://www.usabilitytest.com). All other scenarios were performed with the HCL website, <https://www.hclib.org/>

After the participant finished each scenario, they were asked to rate the ease or difficulty of the task on a 1 to 5 scale (with 1 being very easy and 5 very difficult), the likelihood that they would use the feature in the scenario (with 1 being very likely and 5 being very unlikely), and explanations for their responses.

After all scenarios and post-task questions were complete, the participants completed a debriefing interview. This collected data on how they perceived the website, how easy or difficult the entire experience was, and if the content underneath the browse menu met their expectations.

Finally, participants completed a product reaction card experience. This contained about 50 words, including positive, negative, and neutral terms, from which the participant picked 5 that reflected their opinions about the product, in this case the HCL website.

Results

Background Questionnaire

We had each participant fill out a background questionnaire prior to the usability test. Our background questionnaire found that participants were between the ages of 18-29, most had used the library’s website once or less before, and all used their computer and the internet on a daily basis.

Scenarios

Task One

Task one was the card sorting activity, where we had participants place the menu options from the “Browse,” “Programs and Services,” and “About the Library” into the categories they assumed or expected they belonged in. During this task, every participant noted specific terms that were described as “vague” or “ambiguous.” Common terms that were described this way were “Books and Reading,” “Awards,” and “Online Resources.” Specifically, the “Awards” option was listed as confusing, and most participants associated the term with awards the library had won or awards the library was offering as an awards program. All participants completed this task. The average easiness of this task was rated as a 2.25, or easy.

Task Two

In task two, we asked participants to find a movie to check out for children. All participants were able to locate a movie and complete the task, but there two participants ran into issues when trying to return to the home page or access the banner. Another user noted that a range of ages would be expected during this task and that the organization of childrens’ content was inconsistent compared to other categories. The average easiness of this task was rated as 1.25, or very easy.

Task Three

In task three, we asked participants to find a book to check out that will help them improve their Spanish. Common words used during this task were “straightforward” and “intuitive.” All participants completed this task, and it was overall the most quickly completed of all the tasks. The average easiness of this task was rated as 1.25, or very easy.

Task Four

In task four, we asked participants to find out whether or not the library offers eBooks. Overall, this task took participants the longest out of all the tasks and was rated the most difficult at a rating of 4.25, or difficult. One participant ended the task stating that the library did not offer eBooks, and most participants explained they were hesitantly saying that the library offered eBooks. Two participants mentioned being “confused” when they were directed to an exterior website for eBooks, and one participant notes this task felt like “kind of a shot in the dark.”

Debriefing

During debriefing, we asked participants to rate the easiness of each task and likelihood of using the website to complete that task. The overall average rating of ease was 2.25, which would fall into the easy category.

Product Reaction Cards

In the product reaction cards, participants were asked to select keywords they would use to describe the website. Commonly used words were simple, straightforward, efficient, and effective.

Discussion

In general, the users’ expectations of what a “browse” menu offers did not match the reality of what the browse menu offered. Based on the card sort from task 1, users found many of the categories within the browse menu to be vague, ambiguous, and inconsistent. The most apparent issue relative to task 1 were the categories “Online resources” and “Collections,” which many users either incorrectly categorized in the card sort or incorrectly chose during task 4. In addition to this vagueness, ambiguity, and inconsistency, users experienced some discrepancies in the available options within the browse menu. These discrepancies include inconsistent logic in how the categories within the browse menu are organized (e.g., users expected similar options for Movies/TV as with Books), a lack of expected options

(e.g., users expected an “eBooks” option to be in the browse menu), and what was actually contained within each option (e.g., users expected eBooks to be in “Digital Collections”).

Despite these issues, users successfully completed 15/16 (93.75%) of the scenarios. This completion rate can be attributed to a few different factors. First, the browse menu was the first option that the users chose to complete the tasks. Evidently, the term “browse” matches the function of the menu, and all users went to the browse menu to complete tasks 2–4 (Note: task 1 did not involve the browse menu). For tasks 2 and 3, users immediately went to the browse menu and were able to quickly find a category that eventually led them to task completion. The users also completed tasks 2 and 3 much faster in comparison to task 4. Thus, when users searched for books, movies/TV, and/or content in Spanish, the browse menu offered the users a quick path to find the desired materials. Second, due to our wording of task 4, many users were able to find eBook offerings and complete the task despite arriving at different locations within the website. Despite being able to complete the task, users frequently expressed confusion, and all users arrived at a different finish point than other users, with some users arriving at external websites. Task 4 is also where the only incompleteness occurred, as a user answered “no” to our question of whether or not the library offered eBooks.

All of the users were able to complete the tasks under the allocated time limit. Thus, we cannot point to any critical errors that absolutely prevent users from navigating the website in a timely manner. Nonetheless, the time-on-task for task 4 was significantly higher than tasks 2 and 3. We believe this is a result of a lack of an “eBooks” option in the browse menu, ambiguity/vagueness in the terms “Digital Collections” and “Online Resources,” and a misalignment in the users’ expectations and the reality of what the browse menu offered. Overall, the browse menu provided users with the necessary options to complete the tasks, but the wording, organization, and specific options misaligned with their expectations.

Recommendations

Based on the usability testing data, analysis, and usability principles, our team proposes the following recommendations for the HCL website. They have been divided based on the impact on the user experience. Major impact indicates that users may fail to complete a task or face considerable difficulty in completing a task without the component in place; medium impact indicates that the presence of the component is quite helpful or detrimental in completing a task, but not a necessity; minor impact indicates a component or lack of component that elicits mild annoyance or frustration from users.

Major

- Include a direct link to the eBook section in the browse menu.
- Expand on menu terms.
 - Instead of “Awards,” write “Award-winning books”
 - Instead of “News,” write “Library News”
 - Rename “Digital Collections” “Historical Collections”
- Continue to include direct links from the menu option to the content.

Medium

- Continue to use plain language terms.
- Provide users a way to go back consistently, ideally with consistent headers.

Minor

- Shorten the length of the browse menu.
- Consolidate “Books for adults,” “Books for teens,” “Books for children,” and “Books for preschoolers” into one “Book” item.
- Enable users to check out a book by clicking on the image, not just by clicking “View more” or the genre title.

Introduction

This document reports the results from a usability test conducted to identify potential areas of improvement on the Hennepin County Library (HCL) website, <https://www.hclib.org/>, specifically the “browse” drop-down menu on the home page.

The HCL website provides Hennepin county residents access to the services and resources housed across the 41 individual libraries. Resources include books, databases, movies and tv shows, genealogical data, meeting spaces, internet and computers, and community activities. The object of the study, the browse menu, houses many of these resources. The results from our usability study reveal user beliefs about the relationship between these resources and the browse menu and inform the HCL staff of areas that may need improvement to further meet user needs.

This report reviews the test methodology, discloses the results, analyzes those results, and offers recommendations for improving the website.

Test Goals and Research Questions

Overall, the goals of usability testing include establishing and validating user performance and preference measures by addressing efficiency, error frequency, and user satisfaction.

Our usability test focused specifically on the browse drop-down menu. This menu provides a variety of resources to users without requiring them to search for specific content by title. This focus was chosen because Chip Gehring and the rest of the HCL staff suggested this area could potentially benefit from usability testing, mentioning that they would like to learn more about the user’s expectations of what is located under the browse menu. In response, the scenarios and tasks addressed the language and order of the browse menu and its contents.

Questions that guided the development of our test included: without having seen the website, what menu terms do users associate with which drop-down menu? Do users associate eBooks with the term “Online resources”? Will users associate movies with “Online resources” or “Digital collections,” before seeing the “Movies and tv” menu item further down the menu? What do users expect to find under “Featured languages”?

Our specific research question is as follows: Will a user’s expectation of what a “browse” menu offers match the reality of what the Hennepin County Library’s browse drop-down menu offers?

Participants

Target and Representative Users

When visiting with us on February 6, 2020, Chip Gehring articulated the following characteristics of target representative users of the HCL website: user characteristics may vary widely, as HCL serves all residents of Hennepin County. Users include students of all ages, parents, business people, job seekers, genealogists, retirees, book club members, and recreational readers. Users are not categorized in terms of “primary” and “secondary,” as all users and their tasks are equally important, and every user places a high value on their individual needs.

Due to Hennepin County data privacy practices, specific demographic information, including age and gender, of HCL website users is not available. However, it’s possible to disclose that website users include people with limited computer skills, non-native English speakers, and people of all ages, including

children and seniors. Many of HCL's users have moderate to high levels of computer experience and skills, and many are regular users who use our website frequently and extensively.

The user purpose of HCL users is similarly broad. The interests and goals of HCL users are widely varied, but most want to find materials (including print books and downloadable content) in the HCL collection. Types of information needs and interests our users have include: homework, job-seeking and employment, recreational reading, health, consumer information, genealogy, HCL services and programs.

As for user environment and context, approximately 36% of users access the HCL website from within an HCL location, while 64% are not at a library. Non-library locations could include home, work, and school (elementary and secondary). Patrons can use the HCL website 24 hours a day, 7 days a week. About 33% of users access www.hclib.org with a mobile device or tablet. Of mobile users, 57% use an Apple iPhone and 9% use an Apple iPad.

In summary, the most important characteristic is that there is no one audience for the website; the HCL website is intended for all people. Therefore, participants should have a wide variety of backgrounds, if possible, to best represent the HCL target user audience. However, users in particular that may benefit from better understanding the "browse" menu and its options are those that speak another language, cinephiles, or users looking for books geared toward a specific age-group, like parents looking for books for children.

Actual Participants

Due to the COVID-19 pandemic, we, team High Steaks, did not feel comfortable asking anyone to come to in-person testing. Instead, we recruited peers within our class for remote testing, facilitated with zoom software. In recruiting participants, no distinction was made to seek out participants of a specific age, gender, occupation, education, or familiarity with the website.

Actual participants were evenly split between male and female, had a wide variety of comfort in using new websites, and used the services of local libraries sparingly. All were 18-29 years old. Under the circumstances, the characteristics of our actual participants matched HCL target users fairly well. Below are a few visualizations of participant responses from the background questionnaire.

How often do you use the resources from your local library (not a University library)?

4 responses

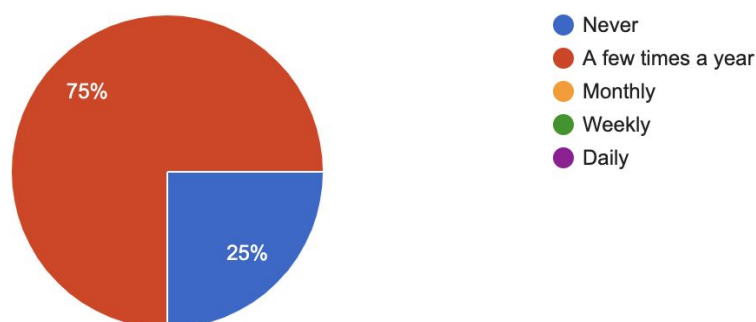


Fig 1. Frequency of participant use of local library resources

If you use your local library's resources, what resources do you use? (e.g. rent books, reserve a meeting room, attend events, etc.)

3 responses

study spaces
Rent books
Borrowing books, attending events

Fig 2. Participant use of local library resources

How comfortable are you with using new websites?

4 responses

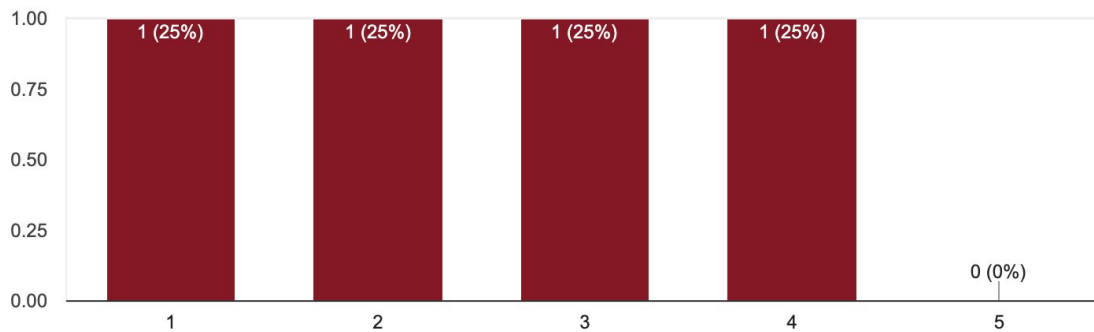


Fig 3. Participant comfort with using new websites, with 1 being very comfortable and 5 being very uncomfortable.

Methods

This section describes the methodology used in evaluating the Hennepin County Library (HCL) website. For full details and forms (questionnaires and product reaction cards), see the Test Plan.

In this usability test, four participants completed a set of realistic web tasks involving the browse menu. Before such tasks, participants completed a background questionnaire disclosing a few demographics. Following informed consent and completion of the background questionnaire, the participant shared their screen with the team and proceeded with the usability test. Participants completed four tasks (Table 1), including a card sort, while using a “think aloud” protocol. Following the completion of each of these tasks, participants rated the difficulty of the task and how likely they were to use the feature tested. After all tasks and post-task questions were completed, a debriefing interview was conducted with each participant to deduce whether the browse menu met the user’s expectations and allowed them to conduct each task efficiently. To further clarify the user’s attitude toward the HCL website, participants picked five words from a product reaction card that best fit their website experience.

Background Questionnaire

Participants completed a background questionnaire prior to testing via Google forms. Data collected included gender, age, library usage, and comfort using new websites.

Tasks and Scenarios with Post-Task Questions

The usability test included four separate tasks. At the start of each task, the moderator read aloud the task description and the participant began the task. Time-on-task measurement began when the participant started the task. At this point, data loggers also began taking notes. After each task, the participant answered post-task questions and elaborated on the task session with the moderator.

Scenario	Task	Post-Task Questions
1. Card Sorting (on usabilitest.com)	Categorize all 36 subheadings under the three title cards listed on the HCL homepage: "browse," "programs and services," and "about the library."	"Please rate how easy or difficult this task was to complete on a scale of 1 to 5, with 1 being very easy and 5 being very difficult."
2. Road Trip Film Search	Starting at the HCL homepage, find a children's show or movie to check out.	Difficulty rating and "Please rate the likelihood that you would use this feature from very likely to not likely at all, with 1 being very likely and 5 being not likely at all."
3. Spanish Seeker	Starting from the HCL homepage, but without using the search bar, find a book offered in Spanish.	Difficulty rating and likeliness rating
4. eBook Evaluator	Using the drop-down "Browse" menu on the HCL homepage, find out if the library offers eBooks.	Difficulty rating and likeliness rating

Table 1. Summary of Participant Scenarios and Associated Tasks

Debriefing Interview with Product Reaction Cards

After all task scenarios were attempted, the moderator asked participants about their impressions of the website and testing experience. Questions included: Did you find what you expected under the browse drop-down menu? How did the options under the browse drop-down menu meet or disappoint your expectations? Do you think the browse menu offered enough tools and options to efficiently complete the tasks? Did any of the tasks stand out as particularly difficult and/or easy to complete? Why?

The final part of the interview, product reaction cards, required participants to pick five words from a list of about 50 words, including positive, negative, and neutral terms, that reflected their opinions about the HCL website.

Results

RQ: Will a user's expectation of what a "browse" menu offers match the reality of Hennepin County Library's browse drop-down?

Quantitative Results

Boxplots were made using RStudio to depict the amount of time that users took to complete each task—also known as the Time-on-Task (TOT)—in addition to the difficulty that the users rated the task after its completion. The code is supplied in Appendix C for further exploration. Out of all four tasks, the card sorting task took users the longest time to complete followed closely by the eBook task with a median time of 5.070 minutes and 3.785 minutes, respectively (Fig. 1). In contrast, the DVD and foreign language tasks took on average around one minute to complete (Mean Time on Task).

The eBook task was found by users to be the most difficult: rated a median of 4, or "difficult" on a scale of one to five (Fig. 2). According to the median values supplied by Figure 2, the card sorting task was most often rated "easy," and the DVD and foreign language tasks were most often rated "very easy" on a scale of one to five in terms of difficulty. The average mean difficulty for the tasks was 2.25. The eBooks task was rated the most difficult out of all the tasks and was clearly significantly more difficult than the other tasks, which were rated easy.

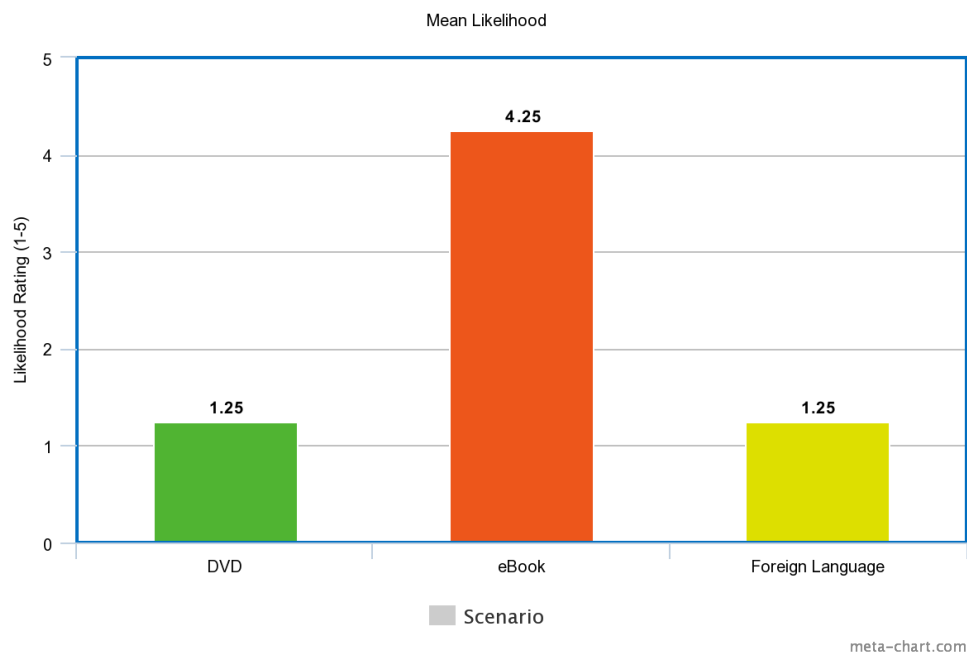


Fig 4. Bar graph of mean likelihood of users completing the tasks using the HCL website post-testing

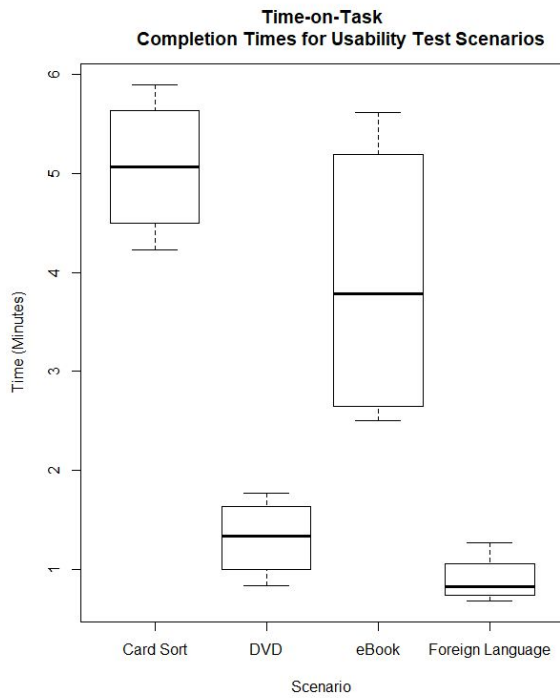


Fig 5. Box plot showcasing median time-on-task (TOT) completion for the card sorting, DVD, eBook, and foreign language tasks

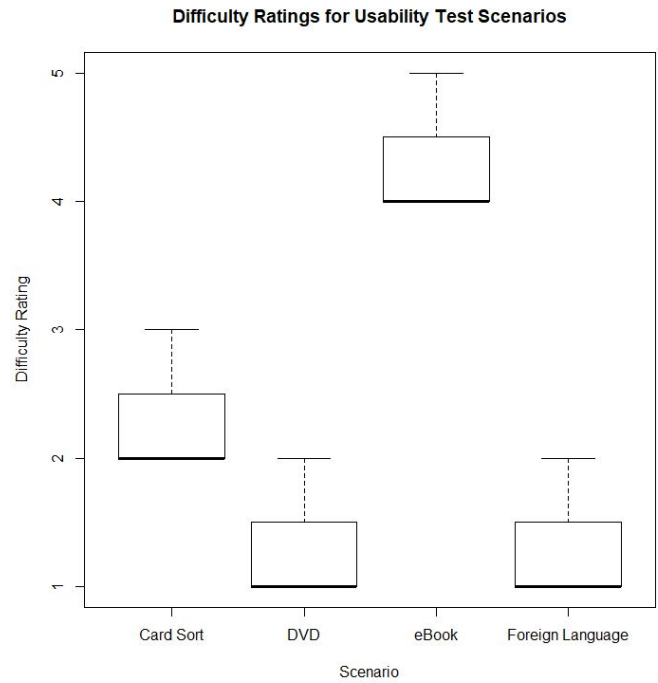


Figure 6. Box plot of the median difficulty ratings given by users for the card sorting, DVD, eBook, and foreign language tasks

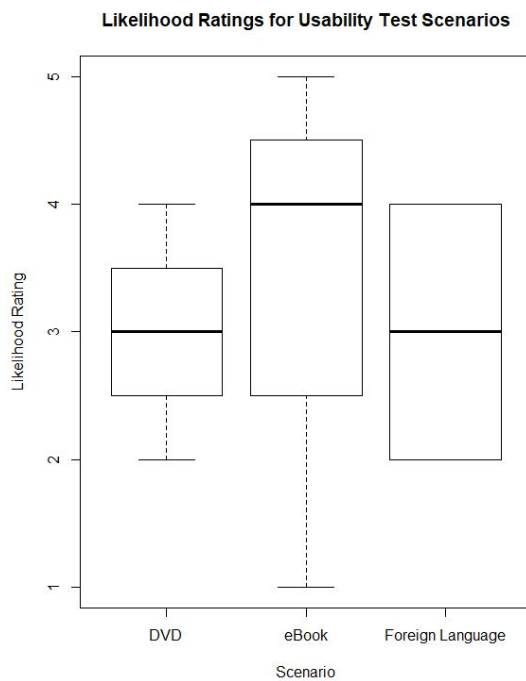


Figure 7. Box plot depicting how likely a user would perform searching for DVDs, eBooks, or books in foreign languages, with 1 being very likely and 5 being very unlikely

Lastly, one-sample t-tests were performed in RStudio to analyze whether our users performed significantly different from what we expected (Table 1). The code is supplied in Appendix C. Unexpectedly, our sample of users finished the card sorting task significantly faster than the ten minute limit (p-value ~ 0.0009). Users also finished the DVD and foreign language tasks significantly faster than the allotted five minutes with p-values 0.0003687 and 6.7483-05, respectively. In contrast, all of our other benchmarks were met as expected. The eBook task was completed on time, and all four tasks were rated as difficult as expected with the card sorting, DVD, and foreign language tasks as “easy,” and the eBook task as “difficult.” P-values are provided below in Table 1 below.

Task	Benchmark	Median Experimental Outcome	P-value	Significance
Card Sort Time-on-Task (TOT)	10 min	5.070 min	0.0008567	Significant
DVD TOT	5 min	1.335 min	0.0003687	Significant
Foreign Language TOT	5 min	0.825 min	6.748e-05	Significant
eBook TOT	5 min	3.785 min	0.25	Not Significant
Card Sort Difficulty Rating	2 out of 5	2.000 min	0.391	Not Significant
DVD Difficulty Rating	2 out of 5	1.000 min	0.05767	Not Significant
Foreign Language Difficulty Rating	2 out of 5	1.000 min	0.05767	Not Significant
eBook Difficulty Rating	4 out of 5	4.000 min	0.391	Not Significant

Table 2. One-sample t-test values for benchmark values

Qualitative Results

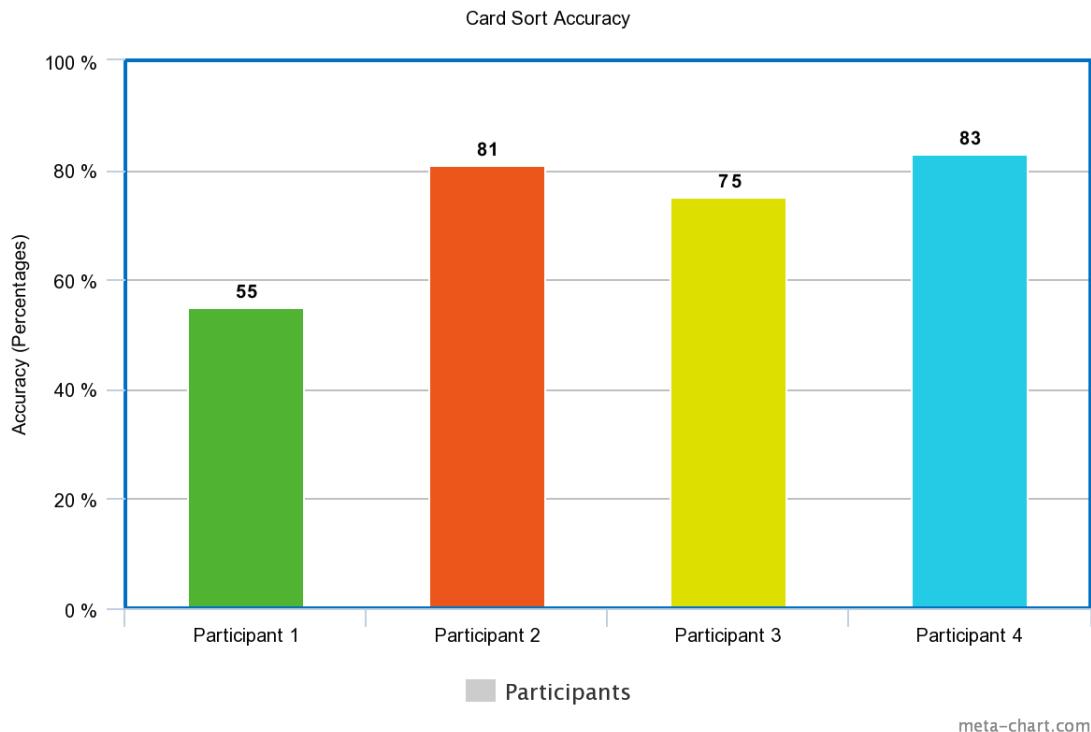


Fig 8. Bar graph visualization the accuracy of each participant in the card-sorting task

The above figure shows the card sort accuracy for each participant. The overall average accuracy in this task was 74%. Participants were asked to speak and think aloud during this task, and in doing so, some notable quotes were recorded:

- “Outreach Services must be a service because it says services.”
- “I’m not sure if ‘Awards’ means that the library has won or if it means awards that the library is offering.”
- “‘Books and reading’ is kind of vague.”

Discussion of Findings

In general, the users’ expectations of what a “browse” menu offers did not match the reality of what the Hennepin County Library website’s browse menu offers. We have identified a few major themes within our results that demonstrate both the strengths and weaknesses of the current browse menu:

Ambiguous, Vague, and/or Inconsistent Categories

Based on task 1 (card sort), users found it relatively difficult to correctly sort certain categories into the browse menu. Users frequently mis-sorted the “Awards,” “Online resources,” and “Digital collections” categories (i.e., users did not put these categories under “Browse”) due to their vagueness and/or ambiguity. One user asked, “Awards that the library won or are they giving out awards?” when confronted with the “Awards” category in task 1 (card sort). This vagueness/ambiguity was also apparent during task

4 (eBooks): Many users selected “Digital collections” when trying to find eBooks despite the category functioning more as a digital archive of historical materials, and many users did not associate “Online resources” with eBooks despite that the category offers users a method to find eBooks (see Figure 9 below). Here, we have identified a key issue that helps answer our research question: There are discrepancies between what users expect certain categories to contain (e.g., users expected “Digital collections” to contain eBooks) and what they actually contain (e.g., “Digital collections” contains mostly historical materials).

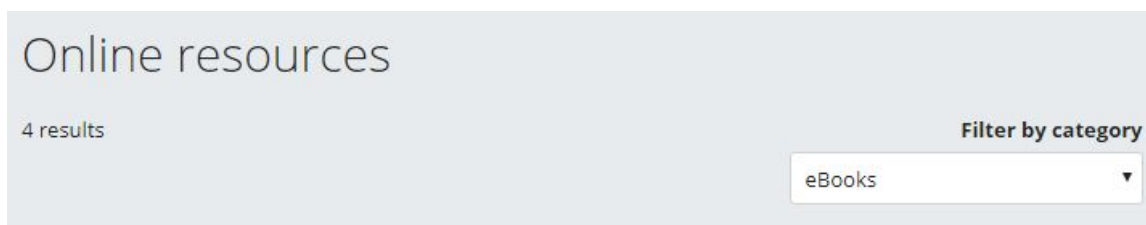


Fig 9. eBooks option in “Online resources.” Taken from hclib.org

Users also found the categories inconsistent in how they were organized within the browse menu. Users expected that the various forms of media (e.g., books, movies, TV, music) would be organized in similar ways within the browse menu. What they found, however, was that the organization for “Books” was inconsistent with the organization for both “Movies and TV” and “Music” within the browse menu. “Books” are given multiple options in the browse menu, while “Movies and TV” and “Music” are only listed as single categories. Despite this inconsistency, users were provided with similar options for “Movies and TV” once the category was selected during task 3 (DVD).

A Lack of an “eBooks” Category

Another key discrepancy between our users’ expectations and the reality of the browse menu was the lack of a specific “eBooks” category. When attempting to complete task 4 (eBooks), users expressed both that they expected an “eBooks” category to be within the browse menu and that they believed an “eBooks” category would have made the task much easier to complete. We believe that the lack of an “eBooks” category—as well as the vagueness/ambiguity of “Digital collections” and “Online resources”—within the browse menu contributed to the significantly higher time-on-task for task 4 (eBooks) compared to tasks 2 and 3 (see Figure 10 below)

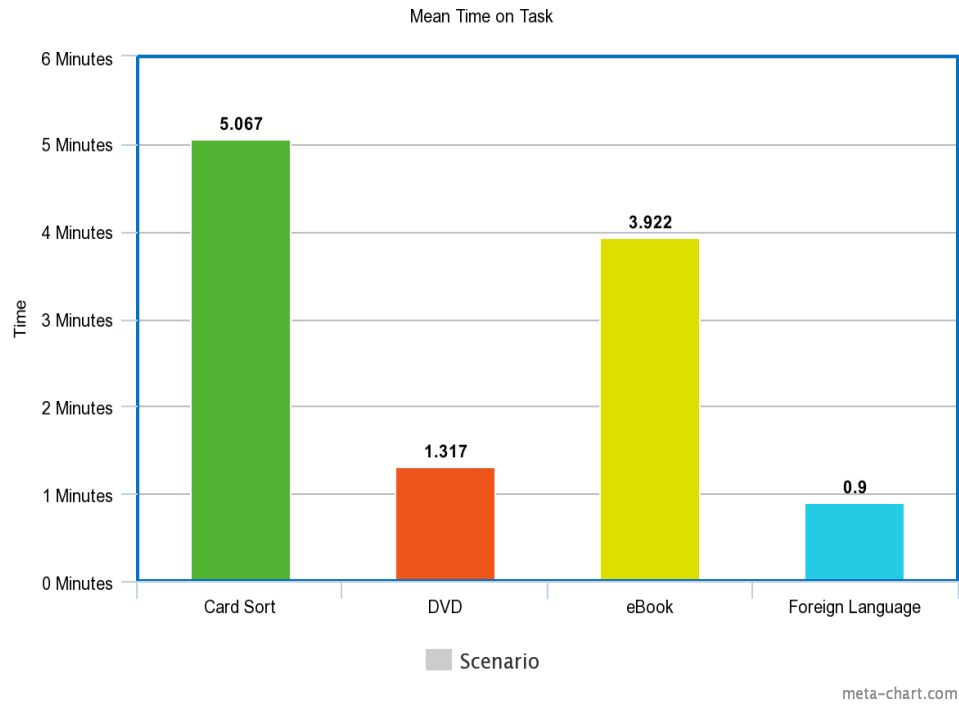


Fig 10. Graph displaying mean time-on-task for each scenario

We also contribute the significantly higher difficulty rating to a lack of an “eBooks” option and the ambiguity/vagueness of certain categories (see Figure 11 below).

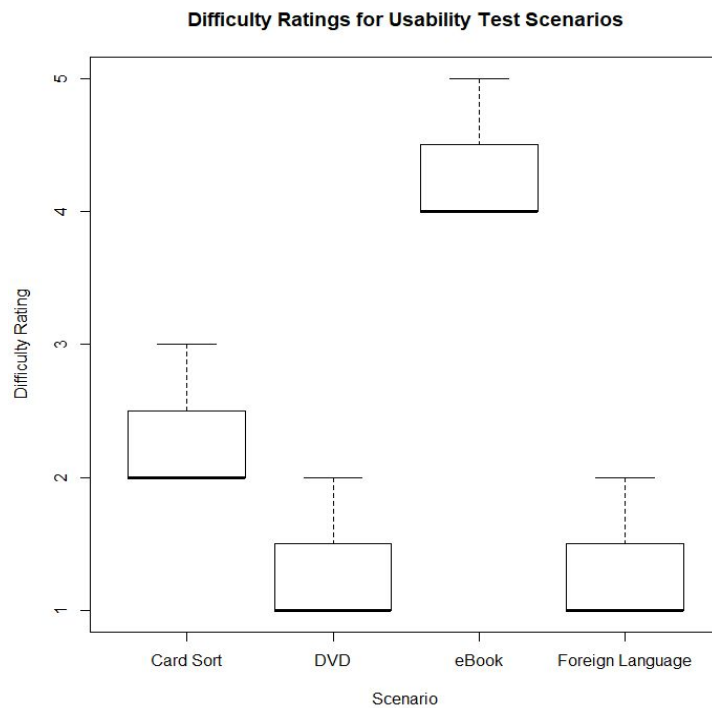


Fig 11. Box plot of the median difficulty ratings for each task

Because of the lack of a specific “eBooks” category, one user asserted that, “I do not believe HCL carries eBooks” despite their availability. Task 4 was the only task in which a user failed to complete it, and all of the users who completed the task arrived at their conclusion of “yes” by different methods than we anticipated (we anticipated users would find eBooks within “Online resources”). Though there are some inconsistencies in users’ feedback, we attribute the users’ relative unlikeliness to use the website for eBooks to the difficulty of completing task 4 (see Figure 12 below).

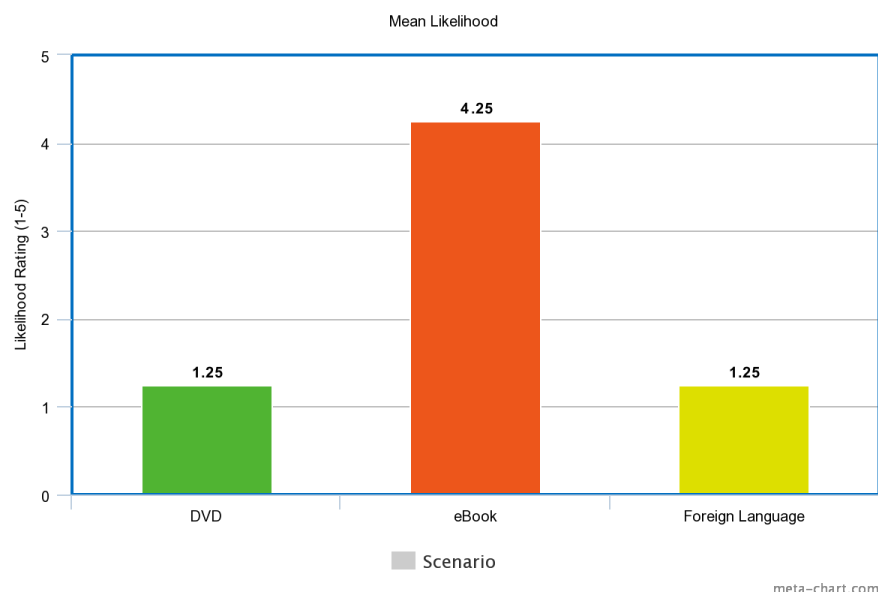


Fig 12. Graph displaying mean likelihood ratings for tasks 2–4 (*Note: A rating of 1 is most likely*)

Intuitive Options, Successful Tasks

Despite the ambiguity, vagueness, inconsistency, and lack of a specific “eBooks” category, users successfully completed 15/16 (93.75%) of our tasks, with 12 of those tasks directly involving the use of the browse menu (the users were told not to use the search feature). Tasks 2 (DVD), 3 (Spanish book), and 4 (eBooks) all required that users use the browse menu to find specific materials, and all users intuitively went to the browse menu to find said materials. Thus, we assert that the term “Browse” matches the users’ expectations of what the term “Browse” means and how a browse menu might function. It’s important to note, however, that once users completed task 2, they gained an understanding of the browse menu’s function. Nonetheless, the significantly low time-on-task for task 2 (see figure 10 above) demonstrates that users intuitively turned to “Browse” to find specific materials.

We also associate the users’ perfect success rate and impressive time-on-task for tasks 2 and 3 with some intuitive options provided within the browse menu: “Featured languages” and “Movies and TV” were all immediately selected by our users, and those categories provided an intuitive path to the required materials. Additionally, once the users selected those categories, the users were presented with options that emphasized recognition rather than recall; thus, their path towards finding the required materials was much more efficient (see Figure 13 below for an example).

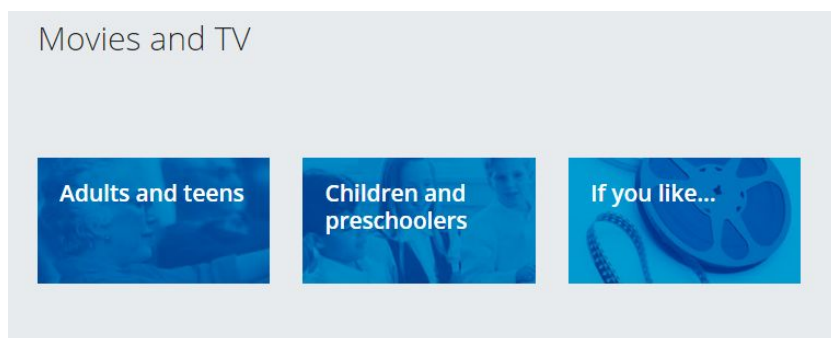


Fig 13. Example of recognition in options. Taken from hclib.org

Users also associated positive words with the website in the product reaction cards. The most common words users chose were simple, straightforward, efficient, and effective. Thus, despite the difficulty experiences in task 4 (eBooks), users generally had a pleasant experience while using the website and the browse menu. We associate this positivity with the intuitive features of the website, as well as the thoroughness of the browse menu itself (i.e., necessary categories were provided save for “eBooks”).

Bridging the Themes

The Hennepin County Library website’s browse menu provides users with most of the categories and options necessary to find the materials they desire. The term “Browse” reflects the menu’s actual function, and the browse menu itself is thorough and intuitive. However, certain categories within the browse menu (we’ve identified “Awards,” “Digital collections,” and “Online resources”) may mislead users due to their ambiguity/vagueness. Additionally, the inconsistency in the organizational logic of the browse menu may confuse users looking for alternative media (i.e., media other than books) and clutter the menu itself. Finally, the lack of a specific “eBooks” option may lead users to believe that the library does not offer eBooks or leave users frustrated and unlikely to use the library’s available eBook selection.

In summary, the website houses much of the materials users expect to find, and the browse menu serves as an intuitive feature for finding said materials. However, the browse menu misaligns with the users’ expectations insofar as certain categories are ambiguous/vague, inconsistent, or absent.

Recommendations

Based on the usability testing data, analysis, and usability principles, our team proposes the following recommendations for the HCL website. They have been divided based on the impact on the user experience. Major impact indicates that users may fail to complete a task or face considerable difficulty in completing a task without the component in place; medium impact indicates that the presence of the component is quite helpful or detrimental in completing a task, but addressing it is not a necessity; minor impact indicates that the component or lack of component elicits mild annoyance or frustration from users. While the recommendations are brief, we included further discussion on how the recommendation can be implemented and why the change is important, including relevant sources and further reading from usability experts.

Major

- Include a direct link to the eBook section in the browse menu.
 - Make it easy for users to locate large collections of ebooks. The current location of the HCL eBooks collection, within a drop-down menu within the online resources, is difficult for users to locate, and prompted one participant to believe that HCL did not carry

eBooks at all. A direct link could increase ebook check out rates, especially during quarantine and the age of COVID-19.

- According to usability.gov, “all critical content and navigation options should be toward the top of the page. Particularly on navigation pages, most major choices should be visible with no, or a minimum of, scrolling.” Further reading: [Guideline 6.3](#).
- Expand on menu terms.
 - Participants couldn’t predict what content was found under certain menu items, like “Outreach services,” “Awards,” “News,” “Digital collections,” or “Online resources.”
 - Examples of improved menu terms include “Award-winning books”, instead of “Awards,” and “Library News” instead of “News.”
 - Rename “Digital collections” and “Online resources” for clarity. These two terms in particular were confused with one another, and participants could not distinguish between the two. Perhaps rename “Digital collections” “Historical collections.”
 - “Category titles must be understood by typical users. Users will likely have difficulty understanding vague, generalized link labels, but will find specific, detailed links, and descriptors easier to use.” Further reading: [Usability.gov Guideline 9.4](#), [Usability.gov Guideline 9.1](#)
- Continue to include direct links from the menu option to the content.
 - Although we have a few, highly-specific recommendations for improvement, participants’ overall found the HCL website “efficient and straightforward.” This is likely due to the existing direct access, or lack of steps, between clicking a menu item and finding content. For example, when a user clicks “Featured languages,” it takes them to a page where they click a language, or when a user clicks “Movies and TV” and is taken directly to movie genres to pick from. Continue to do this!
 - “Design your site hierarchy so that real content is just a click or two away from the main menu pages of your site.” Further reading: [webstyleguide](#)

Medium

- Continue to use plain language terms.
 - Again, on the whole participants found the website easy to use. This could be due to the use of plain language terms. Plain language terms are words that make sense to the average user, and are not jargon-filled or geared toward staff. Examples of plain language in the browse menu are “Featured languages” and “Movies and TV.” Continue to use plain language!
 - In terms of Nielsen’s heuristics, plain language use allows users to employ recognition rather than recall, because terms are written for non-experts, not the creators of the website. Further reading: [Nielsen’s Heuristic #6](#), recognition rather than recall.
- Provide users a way to go back consistently, ideally with consistent headers.
 - Some users could not locate the same headers across all pages. For example, after entering the digital collection portion of the site, participant 2 could not find a link to the HCL homepage. They clicked “Home,” but it took them to the digital collections’ homepage, not the HCL homepage. In addition after navigating to a movie or book, multiple participants similarly tried to click “home” but it took them to a different page than the HCL homepage. Participants eventually defaulted to using their internet browser’s back button instead. The same options for returning home or “going back” need to be

present on all pages of the website. If they aren't, users may assume they are on an external site (as with digital collections)

- Further reading: [Nielsen's Heuristic #3 and #4](#), user freedom and control, and consistency and standards.

Minor

- Shorten the length of the browse menu.
 - Users commented that there were a few too many options and that the menu was long to scroll through. Depending on how large their window is, users cannot see the bottom of the menu.
 - "Users should not have to read through long lists or scroll." Further reading: [usability.gov](#).
- Consolidate "Books for adults," "Books for teens," "Books for children," and "Books for preschoolers" into one "Book" item.
 - If "Movies and TV" or "Featured languages" don't have four categories, then neither should "Books." This may lead some users to believe that HCL does not carry children's movies or language books. Consistency in logic and organization is key for users to be able to predict what content exists where on a website.
 - This will also shorten the length of the browse menu! It takes care of two recommendations with one solution.
 - Further reading: [usability.gov, guideline 16.4](#) and [Nielsen's Heuristic #4](#).
- Enable users to check out a book by clicking on the image, not just by clicking "View more" or the genre title.
 - After navigating to a book genre or to a movie age group, multiple users attempted to click on the images of the content to check it out, and became confused when "nothing happened." They were all confused for a few seconds, tried to click the image again and then eventually clicked "view more" or the genre title. To decrease the amount of confusion a new user may have, enable users to check out titles by clicking on the image, or by removing previews altogether.
 - Further reading: [usability.gov, guideline 10.8](#).

Back Matter

Appendix A: Data Worksheets

Timings and Ratings								
Participant #	Scenario 1		Scenario 2		Scenario 3		Scenario 4	
	Duration	Post-Task Rating	Duration	Post-Task Rating	Duration	Post-Task Rating	Duration	Post-Task Rating
Participant 0								
Participant 1	0:03:46	2	0:01:04	1	0:00:41	1	0:04:43	4
Participant 2	0:05:08	2	0:00:47	1	0:00:56	1	0:05:33	4
Participant 3	No show							
Participant 4	0:04:33	3	0:01:38	2	0:00:45	2	0:02:48	5
Participant 5	0:05:40	2	0:01:32	1	0:01:06	1	0:02:28	4
AVERAGE	0:04:47	2.25	0:01:15	1.25	0:00:52	1.25	0:03:53	4.25
RANGE	0:01:54	1	0:00:51	1	0:00:25	1	0:03:05	1

Issues Identified			Participant Observed					
#	Feature/Location	Observed Issue	0	1	2	3	4	5
	Card Sort	user did not know if she could click the link to begin the task		X / 3				
	Card Sort	user initially looked under the website categories before doing the card sort		x / 2				
	Ebooks task	user wanted to use the search feature instead of browse		x / 1	x / 4			
	Browse menu	user did not find ebooks options		x / 4	x / 4		x / 5	x / 3
	Card Sort	user is not sure if they should login or not		x / 1				
	Ebooks task	User is unsure if they completed the task due to being directed to an		x / 4	x / 4			

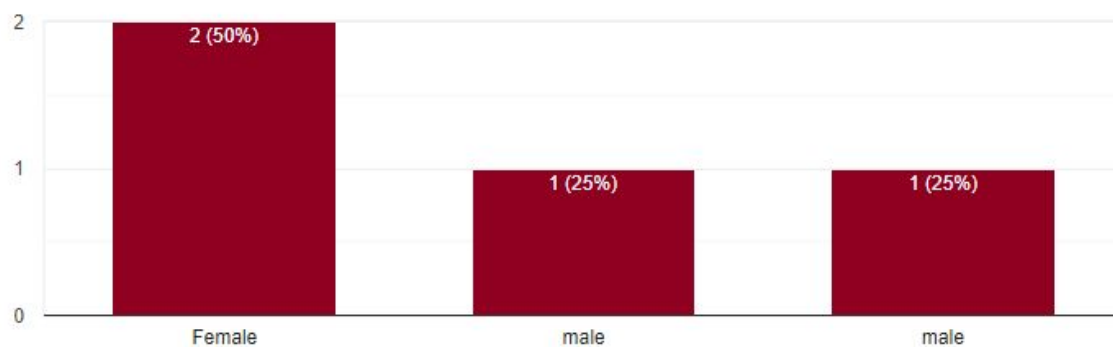
		external website						
Tasks/Website		User prompted to log in	x / 1					
Browse/Tasks		User could not select a specific title	x / 2					
Browse Menu on task 4		User tried to return to browse menu and could not	x / 4		x / 4			
Browse menu/search		User wanted a filter function	x / 3					
Browse Menu		"digital collections and online resources was a little bit confusing for me"	x / 4		x / 4	x / 4		
Card Sort		User expresses that certain categories are vague/ambiguous	x / 4		x / 4	x / 4		
Card Sort		user wanted to be able to refer to the terms after the task				x		
Ebooks task		Could not find ebooks, believes the website does not offer ebooks				x / 5		
Browse menu		Browse menu was too long/too many options				x / 2	x / 1	
Browse menu		Inconsistent logic in browse menu					x / 3	

Product Reaction Cards				For each participant, record the words they identified from the Product Reaction Cards. Include as many columns as necessary.	
Participant 0	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5
accessible	easy to use	effective	no show	simplistic	straightforward
efficient	efficient	boring		straightforward	time-consuming
comfortable	simple	straightforward		confusing	familiar
organized	useful	inconsistent		efficient	inconsistent
time-saving	informative	useful		informative	robust

Background Questionnaire Data

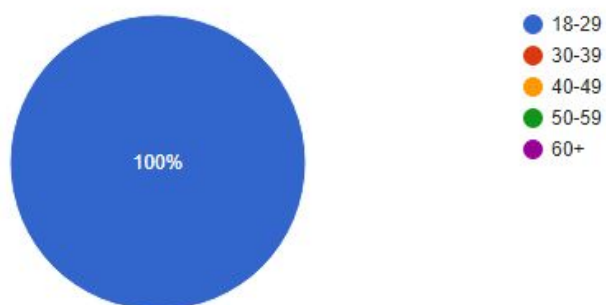
What is your gender?

4 responses



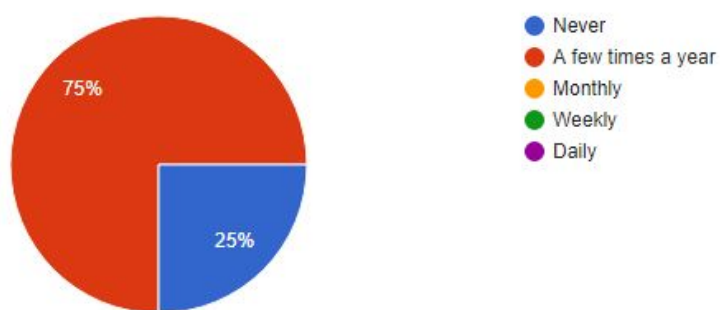
What is your age?

4 responses



How often do you use the resources from your local library (not a University library)?

4 responses



If you use your local library's resources, what resources do you use? (e.g. rent books, reserve a meeting room, attend events, etc.)

3 responses

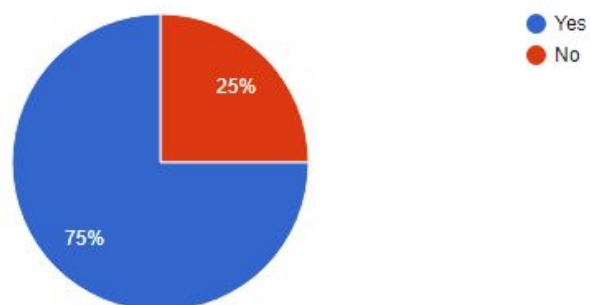
study spaces

Rent books

Borrowing books, attending events

5. Have you visited the Hennepin County Library website before?

4 responses



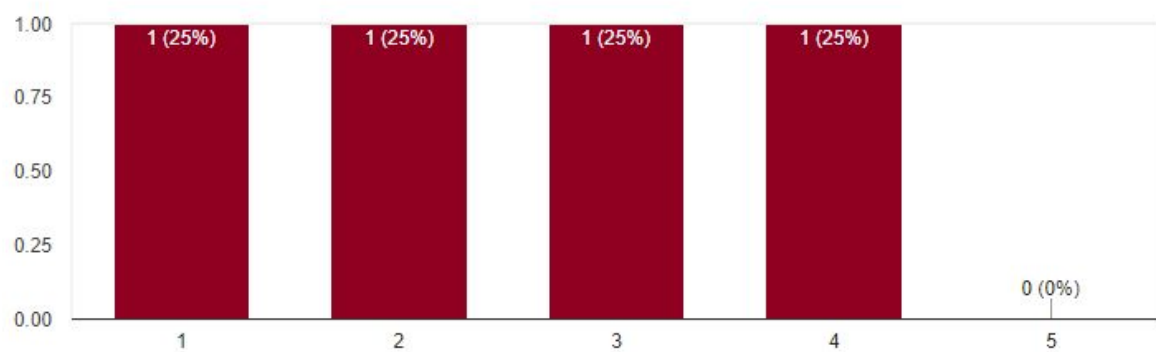
6. If your answer for number 5 was yes, how often have you visited the site?

3 responses



How comfortable are you with using new websites?

4 responses



Debriefing interview transcript for participant 1:

Thank you for participating in our usability test! We appreciate your cooperation with and your contribution to our research efforts. Please take a few minutes to answer the following post-test questions:

1. Did you find what you expected under the Browse drop-down menu? How did the options under the Browse drop-down menu meet/disappoint your expectations?

Response: “I think I found most of what I had put under the browse drop-down menu from the first task of placing different titles. So I think it was pretty expected, what I found under the browse drop-down menu, so it definitely met my expectations.”

2. Do you think the Browse menu offered enough tools and options to efficiently complete the tasks?

Response: “Yep. For sure. At least a majority of the tasks. Two out of three were really simple, and I had them done in under, like, five minutes, so I feel like they were really easy to follow.”

3. Did any of the tasks stand out as particularly difficult and/or easy to complete? Why?

Response: “Yep. So, the very last task about finding whether or not the library offers eBooks was a little more difficult in comparison to the other two tasks, which were very, very simple, and I think that’s only because I started looking in the wrong place, and I did not scroll down far enough, even when I got to the right place.”

4. Please feel free to leave any additional comments, questions, and/or concerns here:

Response: “I don’t have any right now.”

Debriefing interview transcript for participant 2:

Thank you for participating in our usability test! We appreciate your cooperation with and your contribution to our research efforts. Please take a few minutes to answer the following post-test questions:

1. Did you find what you expected under the Browse drop-down menu? How did the options under the Browse drop-down menu meet/disappoint your expectations?

Response: “It wasn’t really what I would expect from a browse tab, because sorting books by like, books for kids, or books for teens, or books for adults, that’s not how I categorize books, in my mind, because teens can read the same books as adults a lot of the times. So that was a little bit weird. Also the “Online resources” versus “Digital collections.” Some of the word choices that they used there. I would expect it to be sorted by like book genres types of books, like eBooks or audiobooks, maybe that sort of thing.”

2. Do you think the Browse menu offered enough tools and options to efficiently complete the tasks?

Response: “For the most part, it did. For the tasks like featured languages, that was pretty easy to find. For books for kids, that was also pretty easy. Like I said, the “Digital collections” and “Online resources” were a little bit confusing, for me. But, other than that, for the most part it did.”

3. Did any of the tasks stand out as particularly difficult and/or easy to complete? Why?

Response: “The first three were easy. I could find everything pretty quickly using the browse menu. The last one was more difficult. Like I said, because I wasn’t super confident that I found actual eBooks. The wording wasn’t super clear on the browse menu for that. So that one was more difficult for me.”

4. Please feel free to leave any additional comments, questions, and/or concerns here:

Response: “I don’t think anything that I haven’t already said.”

Debriefing interview transcript for participant 3:

Thank you for participating in our usability test! We appreciate your cooperation with and your contribution to our research efforts. Please take a few minutes to answer the following post-test questions:

1. Did you find what you expected under the Browse drop-down menu? How did the options under the Browse drop-down menu meet/disappoint your expectations?

Response: “I certainly found what I expected to find there, which is books, different collections, movies and TV, what you would typically browse for. I feel like the content in there isn’t the issue. I feel like some of the wording of browse or the tabs that lead to different pages are a little bit misleading, because “Digital collections” was the second option, and it sent me straight to a completely different website. So from the point of view from someone who is looking for different books and collections of books, I don’t know if they’d want to be navigated to a different website right off the bat, especially if it’s one of the first options in the browse tab. But, yeah, for the most part, I saw what I expected to find in the tab.”

2. Do you think the Browse menu offered enough tools and options to efficiently complete the tasks?

Response: “Yeah. I think it had enough material there. I think there was definitely enough content that would suffice for what a user would want.”

3. Did any of the tasks stand out as particularly difficult and/or easy to complete? Why?

Response: “Yeah. I think it was really easy to find the books, the children’s movies or the children’s TV show one. That was easy, especially after I had experience with the first task. But going to the different, finding books and finding shows or movies to borrow was laid out pretty nicely and easy to find. But, one that was difficult was the eBook task or scenario, because there were two options that could possibly indicate that there were eBooks, but upon going to those tabs, there wasn’t anything that would lead me to believe that they offered that service.”

4. Please feel free to leave any additional comments, questions, and/or concerns here:

Response: “I think that the layout of it, the aesthetic of it is nice. For the most part, it’s easy to engage with and offers a large category of different content. Overall I think it’s good, but I think some of the wording and what they include in the tabs. The browse menu should possibly be reevaluated from how these tests go or just from my experience with it too. It was a little difficult to, there seemed to be a lot of options in the browse tab, so it was a little difficult to find exactly what I needed to do”

Debriefing interview transcript for participant 4:

Thank you for participating in our usability test! We appreciate your cooperation with and your contribution to our research efforts. Please take a few minutes to answer the following post-test questions:

1. Did you find what you expected under the Browse drop-down menu? How did the options under the Browse drop-down menu meet/disappoint your expectations?

Response: “Generally, I found what I expected in terms of what I was actually looking for in the context of the task. Again, there were a few categories such as “Books for kids” versus “Movies for kids” that aren’t really apparent when you go onto the menu. So, I expected it to be kind of united, you know, “Books for adults” are probably just “Books” and “Movies and TV” would be just “Movies and TV for adults,” and then you’d have children’s resources down at the bottom. I’m trying to recall, I haven’t been on my own county library’s website in a while, so I don’t know if that’s how they do things or not. So in terms of practicality, I found what I expected. In terms of theoreticality, there were definitely some items that did not meet my expectations.”

2. Do you think the Browse menu offered enough tools and options to efficiently complete the tasks?

Response: “I think in some regards, it offered more than enough. Like you go under “Books” for example, and you see books, books, books, books, books for everything, and there were some clearly important resources, like eBooks, that the library doesn’t necessarily highlight on the menu. So, that would be something, again, would go contrary to my expectations, but I was able to complete everything pretty efficiently, so not that it mattered personally.”

3. Did any of the tasks stand out as particularly difficult and/or easy to complete? Why?

Response: “There was no task that stood out as particularly difficult or particularly easy to me, just because I am the type who is fairly comfortable getting around new websites or unfamiliar websites and things like that. I just go by my intuition. So, I was comfortable completing everything, and I didn’t think anything, in particular, stood out, for me.

4. Please feel free to leave any additional comments, questions, and/or concerns here:

Response: “Great work, guys. That’s the only comment that I have.”

Appendix B: Sample RStudio Code

Side-by-side Boxplot Example Code (Made Figure 5)

```
> boxplot(High_Steaks_Data$TimeA~High_Steaks_Data$ScenarioA, xlab =
+         "Scenario", ylab = "Time (Minutes)", main= "Time-on-Task
+         Completion Times for Usability Test Scenarios")
```

T-test Example Code (T-test for eBook Difficulty Level)

```
> t.test(High_Steaks_Data$DifficultyA[ScenarioA=="eBook"], conf.level = .95, alternative = "two.sided",
mu=4)
```

One Sample t-test

```
data: High_Steaks_Data$DifficultyA[ScenarioA == "eBook"]
t = 1, df = 3, p-value = 0.391
alternative hypothesis: true mean is not equal to 4
95 percent confidence interval:
 3.454388 5.045612
sample estimates:
mean of x
 4.25
```