Eye Tracking:
Kent State Library

December 11, 2016

This document presents the eye tracking output and critique of tasks from the November/December 2012 KSU library study in which users were asked to suggest a book purchase to the KSU library.

Designer- Amy Schlachter

Executive Summary

Background

Usability testing was performed on the Kent State Library website over two months in 2012. Five participants were asked to perform a single task in which they needed to request that the library purchase their favorite book.

Notable Findings

Overall, the participants struggled significantly with this task. Only 1/5 participants were able to complete the task, with 2/5 participants having even navigated to the area of the site where the desired link was located. The users as a whole instead seemed to mainly focus on the Books & More and Ask Us areas of the content box located on the left middle portion of the page.

Overall, the participants seemed somewhat confused about how to complete the task with 3/5 participants performing seven or more clicks while searching for the right link. In addition, multiple users made statements like, *"It really kind of was hard."* and *"I'm kind of just looking around here. I don't really know where it would be."*

Recommendations

Given that participants seemed to universally focus on the main search and content area on the center left portion of the page, and most specifically the Books & More and Ask Us areas, it is recommended that the link be moved to one of these areas. In addition, the utilization of a title that would better represent the task is recommended as it didn't seem clear to the participants that they would find the resource request function under the How are We Doing link.

Future Task Recommendations

Looking forward to future studies, it is recommended that we focus on tasks that will specifically enhance the eye tracking data we receive from the study. More specifically, it is essential that we focus on realistic task oriented scenarios that are both open and close ended utilizing the use of multiple functions or pages within the website. We feel we can accomplish this through scenarios based on the following three functions:

- Searching for books and journal articles on a subject that interests the participant
- Seeking information on how to reserve a group meeting room in the main library
- Finding the hours of operation for a campus resource area

Project Background

Project Goal

Evaluate the usability of the Kent State University library website utilizing task analysis and eye movement data produced by the Tobii eye tracking software.

Task

Each participant was presented with one task:
You notice the library doesn't have your favorite book. How would you suggest the library make a purchase of that book?

Methodology

In person, recorded sessions were conducted from November to December 2012 on the Kent State library website. Tobii eye tracking software was utilized to track the eye movements of participants as they attempted to complete the task. This information was then used to evaluate the need to make changes to the location of links on the site.

Participant Information

Participant 1

Task Analysis

Participant 1 exhibited a lot of excess eye movement while completing the task, with 118 fixations in the first 49 seconds alone. While being read the task she gazes across much of the page as she is listening. Once she begins the task her eye movements slow, and she appears to focus mainly on the center search box area with the most frequent and concentrated fixations in this area as exhibited by the large yellow circles in the gaze plot. She did have some outlying fixations as well, which could be skewed given she was asked to complete a separate task in the middle of completing the first.

"It really kind of was hard."

Gaze Plot- First 49 seconds

Demographics

Female
Age 18-34

Path

Home
Support for Courses
Back Button
Books & More Tab
Ask Us
Home
How are we doing
Suggest a Resource

Outcome

Success
Successfully found the correct link at the 2:05 mark.

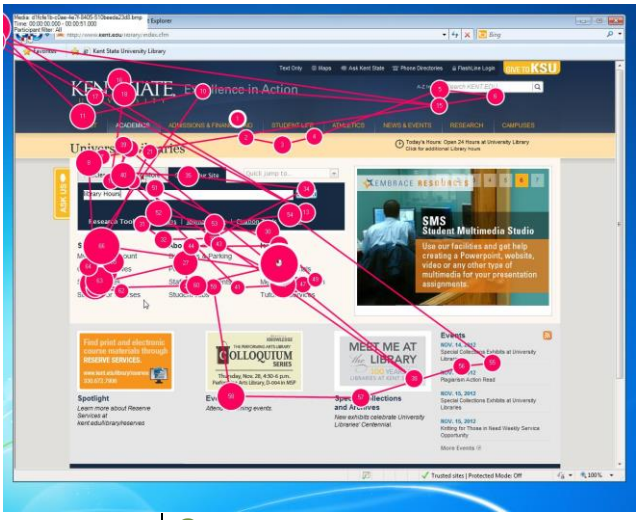
Participant 2

Task Analysis

Participant 2 had a challenge initially with the task because she did not start from the library homepage. Once back to the homepage, she had 67 fixations in the first 51 seconds. As you can see from the gaze plot, she spent a lot of time on the center content area with very few fixations outside this area. She spent much of the task blindly clicking in hopes of finding the area she needed. She was very focused on the Ask Us link, and explained that this is where she would typically think to go to complete this type of task.

"I'm kind of just looking around here. I don't really know where it would be."

Gaze Plot - First 51 seconds



Demographics

Female
Age 18-34

Path

Books and more
Ask Us
Research Tools
Circulation
Find Books in the Libraries
Back
Quick Links
Ask us

Outcome

Fail
Particpant gave up 1:53 minutes into the task.

Participant 3

Task Analysis

Participant 3 had a few accessory eye movements at the beginning of the task as he was being read the instructions due to the fact that he seemed to click on another page and need to navigate back. Once the task was read he seemed to more thoughtfully look around the main search content area on the left center portion of the page with 58 fixations in the first 20 seconds. When he didn't discover what he was looking for, he seemed to venture out to the lower and upper portions of the screen as evidenced by the outlying fixations in the screenshot to the right. In his search he tried only one link, "Ask Us". He spent some time thoroughly scanning this page before giving up on the task.

"I'm looking for, like um, a button that would say request."

Gaze Plot - First 20 seconds

Demographics

Male
Age 18-34

Path

Ask Us

Outcome

Fail
Gives up after 39 seconds

Participant 4

Task Analysis

Participant 4 had 28 fixations in the first 12 seconds. Although he does have some outlying fixations in the first 12 seconds of the task, many of them occurred as he was being read the task instructions. Once the task begins, the majority of his fixations are centralized to the center left content search area. When he doesn't immediately discover what he is looking for in this area, he begins to scan the four columns of information below this area and then moves to the tabs in the content box search area. He then moves on to the quick link dropdown menu before scanning the main content area once again, and finally deciding to explore OhioLink. At this point, the gaze pattern could be skewed due to a glitch in the system which took his attention away from the task from the 34 second mark to the 53 second mark when the OhioLink box pops up. After scanning the OhioLink area he scans the Library Tutorials link prior to giving up on the task.

Gaze Plot- First 12 seconds

Demographics

Male
Age 18-34

Path

Books & More
Quick Links
OhioLink
Library Tutorials

Outcome

Fail
Moderator ends task after 1:20.

Participant 5

Task Analysis

Participant 5 had 28 fixations in the first 11 seconds. He very carefully looks around the left center content area. He looks through each list of links moving from left to right through the links with very few fixations outside of this area. He then moves on to the search box links and tabs in this area before selecting the Books & More tab. Participant 5 was the only participant aside from participant 1 to navigate to the bottom of the page and spend any amount of time looking that the links in the footer. Although he did spend a short time looking across the area, and even had 4 fixation points just above the How are we doing link he did not explore the link before moving back to the top of the page.

Gaze Plot - First 11 seconds

Demographics

Male
Age 18-34

Path

Books & More
My Library Account
Home
Search Our Site
Books and More
More
Home

Outcome

Fail
Participant fails at 1:17.

Summary of Aggregated Eye Gaze/Heat Map Information

The heat maps shown below display the combined fixations of the users on the home page as they complete the task. The frequency and length of time spent looking at a particular area is defined by the color of the area on the map. The red areas are areas where participants fixated the most, with the green being the least, and areas without color not having been fixated on at all.

First 5 Seconds

In the first 5 seconds the majority of the initial attention participants paid to the site was centralized on the left center portion of the page in the content and search box area. While these stats don't give much insight in terms of the task at hand given that at this stage they would still be listening to instructions, it does provide insight into the area of the page participants are naturally most fixated on. With this knowledge, we can evaluate the potential placement of the most used or important site links in this area.

First 20 Seconds

You can see here that as the participants are beginning to hear the instructions and focus more on the task they are being asked to complete, they start to scan more of the page in search of something that may provide a solution to the task. Their focus changes to be most intense over the Books & More tab, and first column of links in the content box.

Entire Task

The map of the entire task further enforces the knowledge we gained from the first two figures in regards to the areas which garnered the most focus by the users. Overall, it can be seen that in addition to the first column of links in the content area being a high area of fixation, the third column also tended to pull users attention. In addition, while there was a lot of scanning across the page by users, there is very little fixation toward the bottom of the page where the "How are we doing" link the users are looking for is located.

The aggregate gaze plot and opacity maps further reinforce the above analysis that the participants main focus was over the main content area to the left center of the page, with the most fixation in the Books & More section. It is clear that participants associate the task of requesting a book with the tab sharing the word.

Summary of Notable Findings and Recommendations

Qualitative Findings

Overall, the participants seemed to struggle significantly with this task. They seemed a bit confused on how to even begin the task, with a number of participants simply blindly clicking on links, unsure as to whether they would take them to the correct area of the site to complete the task. This was true even for the one participant who completed the task. It took a number of unsuccessful clicks and page views before she mistakenly happened upon the correct area stating after the task, *"It really kind of was hard."*

Quantitative Findings

4/5	participants failed to complete the task
2/5	participants scrolled down to fixate on the footer where the "How are we doing" success link was located
4/5	participants attempted to find the success link in the Books & More section
3/5	participants tried to find the success link in the Ask Us section
3/5	participants failed or gave up on the task in 80 seconds or less
3/5	participants had 7 or more clicks in an attempt to complete this task
2.3	Average number of fixations per second prior to first click.
4/5	Participants had 2.3 fixations or more per second prior to their first click. Participant 2 fell below this mark with 1.3.

Recommendations

With a 1/5 completion rate, it is clear that the location of the "How are we doing" link is not located in an ideal place on the page. Given that participants seemed to universally focus on the main search and content aread on the center left portion of the page, and most specifically the Books & More and Ask Us areas, it is recommended that the link be moved to one of these areas. In addition, it didn't seem overly clear to the two participants who actually explored the footer area that the How are we doing link would be associated with the book request task. It is recommended that the Suggest a Resource for Purchase link be moved to a different area, such as a solo link or suggestion link in the Books & More or Ask Us areas.

Task Critique

Task Administration

It's important to point out that in reviewing the task videos the administration of the task provided some concerns when evaluating the validity of the results. The following outlines moderation concerns that may or may not have affected the results:

- **Scripted Task Introduction**: It does not appear as though a scripted task scenario was used for this study. Each participant received a slightly different explanation of the scenario. This is challenging as it affects the understanding the participant has of the task which can in turn affect their ability to complete the task as some participants may receive better quality explanations than others.
- **Leading**: There were instances in several of the videos where the participants were led by the moderator in one direction or another. For example:
    - When participant 4 clicked on OhioLink, he was told by the moderator that she didn't think the task solution was in OhioLink.
    - Participant 1's moderator also seems to be speaking to her a bit more conversationally by the end of the task even showing excessive excitement when she completes the task.
- **Task Interruptions**:
    - Participant 1 was interrupted 40 seconds into the task and asked to complete a completely separate task so the moderator could see if she was able to navigate back to

the home screen without using the back button. The introduction of this task skews the statistics because it adds in fixations and clicks that would have never otherwise existed, interrupts the participants thought process, and affects their ability to complete the task in a timely manner. At another point the moderator also appears to be giving someone else instructions to go to a certain room which could have also served as a disruption to the participant.
    - Participant 2 was not reset to the home page prior to the task and was then instructed during the task on how to get back to the homepage. This allowed for 30 seconds of eye movements being captured in relation to this task that didn't involve the task itself which skews the click and fixation results.
    - Participant 4 was interrupted by a computer glitch at 45 seconds and then again by the moderator at the 1:20 mark while he was still looking around the site attempting to complete the task. This is an issue as it brings into question whether the participant was given enough of an opportunity to complete the task before being cut off.

Additional Limitations

- **Think Aloud**: Without context for the fixation data, it can be difficult to properly interpret the results. There was limited description and think aloud during the test or retrospectively of the participants thought process throughout the videos. The addition of a technique like this to the use of eye tracking would enhance the quality of the results.
- **Delayed Page Launch**: Participants were read the task instructions while on the Kent State library page. It is widely accepted that the task should be read first, and page launched after to limit examination of the page by the user that may have never otherwise occurred if they were attempting to complete the task on their own. This was evident by the fixations noted by multiple users prior to the beginning of the task.

Task Recommendations

The following alternate task recommendations are being made as alternatives to the resource request task presented in this report. These tasks were chosen as they enhance the ability to gain good insight into the sites usability utilizing realistic task scenarios which would mimic use outside the lab. These types of tasks were chosen as it is important to utilize multi page and function tasks when using eye tracking software to preserve the validity of the results. Asking someone to look at one page or do non scenario oriented tasks often provides a significant number of fixations on the page that would not typically occur in a task oriented scenario and leaves you with unusable data.

Task 1

Scenario	
You are interested in learning more about topics within your major. Search for books and journal articles on a subject that interests you. *If the participant struggles to choose a topic they will be given a topic based on their areas of interest answers from the pre task screener.	
Rationale	**Task Benefit**
This task was chosen as it is a task a student would typically perform on the library website. Regardless of whether they are searching for pleasure or research purposes, interaction in these areas is typical of a student and gives insight as to whether we are meeting their most basic needs.	Adding in an open ended task helps us to learn where people are looking on the page when they aren't being influenced by anyone else. This better mimics actions they would take when working with the site outside the lab.

Task 2

Scenario

You are meeting with some friends to study for a test tomorrow. You want to reserve a meeting room at the library so you can have a private space to talk. How would you schedule a group meeting room in the main library utilizing the library website?

Rationale	Task Benefit
This task was chosen as it helps us to understand how the participant is interacting with the university website in non-research related ways. Given that the website offers a number of resources and opportunities aside from searching for books, it is important to understand whether students are able to locate and utilize these functions as well as they can the general library information and catalog search functions.	To ensure the most valid data, it is important to give participants tasks that allow them to use clickable links and navigate naturally through the website. This ensures that the participant will not spend more time than they normally would exploring, and registering fixations on any one page.

Task 3

Scenario

You are writing a paper that needs reference citations, but you are struggling to figure out the correct way to cite your sources. You've heard the Writing Commons has tutors who can help you with your citations, but you are unsure of their hours. Find the hours for the Writing Commons.

Rationale	Task Benefit
This task was chosen because there are typically a large number of assignments that a student is given during their college career that require citation of the sources they've likely gotten from searching the library website. There are library related services offered on campus that a student may want to utilize when needing assistance in citing these sources. It is important that a student can easily find and access these resources.	In order to maintain a realistic task scenario, it is important to consider that most interactions a participant will have with a website are goal-oriented. Giving the participant a goal to accomplish ensures that we have a way to gauge their success in navigating the website while providing as realistic an experience as possible.