Eyetracking Study:
Kent State University Library

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Executive Summary

Eyetracking web usability studies allow designers to see where the “hot spots” are and what information or graphics catch the users’ eyes. In this eyetracking usability study users were asked to look at the Kent State University Library website and complete one task. Moderators set up the Tobii Studio eyetracker to discover where each of the participants focused on. Once calibrated to the participant the eyetracking technology records eye “fixations” and records these as plot points and hot points on heat maps. This data allows testers to see what participants see and informs design teams for website improvements based on the usability findings. Using this kind of data from a usability study allows the team to get objective, qualitative data to provide to stakeholders and the design team in order to address website usability issues.

For this study the moderator set up a computer with a webcam and eyetracking software while the screen recorder captured the participant’s computer screen. The moderator sat next to the participant and offered guidance on the task at hand. The screen capture, webcam recording and the eyetracking data was then compiled and dispersed to the team as videos, screenshots, fixation plot maps, and heat maps. The fixation plot maps and the heat maps were both separated per participant and overlaid to encompass all the participants and their varied viewpoints.

In this study five participants were included in this study. Two women and three men, all relatively young, college aged individuals. The five participants were asked to go to the Kent State Library homepage and imagine the library did not have a book they wanted so they needed to request the library purchase a particular item. Of the five participants only one was successful in completing the task. All five participants had a difficult time completing this task and the four who were unsuccessful in completing the task gave up in less than two minutes. When asked how difficult the task was on a scale of 1-7 (1 being the most difficult and 7 being the least difficult) the majority of participants said the task rated a 1 or a 2 on the scale of difficulty. The participants all seemed very frustrated with this task and when asked to talk aloud or asked what they were looking for many stated they didn’t know or were unsure of what type of link would provide them with the needed information. Two of the five participants wanted to phone a librarian to find out the correct way to go about this task.

Using this qualitative data will help provide the design team with information on how participants view and use the website when looking for specific information. Looking at this behavior informs critical decisions on site navigation, placement of images, text size and style and where to place important information. Eyetracking data is unique in that the data provided to usability teams is not something the participant or the moderator could explain or see in a traditional usability test session. Viewing this data in plot maps and heat maps allows moderators to see
what the participant is viewing and for how long. Providing this type of qualitative data to the design team is an important aspect of user-focused design.

**Task and Participants**

**Participant 1:**

Length of time on task: 2 minutes 13 seconds  
Number of fixation points: 49

The fixation points plotted show a reverse “F” formation with the primary points in two long horizontal lines. This participant was drawn to the large image at the right of the library webpage and then the top level navigation where the hours information is located. She then looked at each link in the mid level library navigation bar multiple times. She then clicked on the mid level navigation tabs. The moderator interrupted her task when she then asked the participant how she would go about going back to the homepage without clicking the back button in the internet browser. She then clicked on the library logo and returned to the library homepage. After some prompting from the moderator she then scrolled down to the lower navigation to click on “How are We Doing” and found the link to suggest a purchase online form. This was the only participant to successfully locate this online form and complete the task.
Participant 2:

Length of time on task: 1 minute 8 seconds
Number of fixation points: 57

The fixation points on this participant's map show an “F” formation with an extra horizontal line formation. The participant began looking at the upper level navigation then moved towards the mid level library navigation. Then quickly and briefly he checked out the Kent.edu site search box. He clicked through the tabs and then selected “Ask Us” for more help. When prompted by the moderator who asked what he would do if he was at home and couldn't find what he needed what would he do? He said he would call staff for more help or maybe attempt to use the chat service even though he had never done so before. After viewing the mid level navigation for almost a minute he glanced up to the Kent.edu site search box again then scrolled down to the lower library navigation.
Participant 3:

Length of time on task: 1 minute 12 seconds
Number of fixation points: 28

This participant’s gaze focused in a more centralized pattern than the tradition “F” formation. He first focused in on the large picture to the right of the mid level library navigation and is the second participant to do so. After four quick fixation points on the lower part of the photo he then focuses his gaze on the mid level library navigation, specifically the dark blue library search box portion. After searching this area he then looks up to the top level navigation and focuses on the library hours information to the right of the screen. Once again he then focuses on the mid level library navigation and then goes straight up to the top level site navigation tabs only to return to the mid level library search bar.
Participant 4:

Length of time on task: 2 minutes 10 seconds  
Number of fixation points: 66

This participant’s was very active in viewing the majority of the library homepage in this upside down “F” formation. The participant started at the top level navigation moving across the screen towards the right hand Kent.edu site search box then focused down on the mid level library navigation then went back to the top level navigation. Moving away from the top level navigation and returning to the mid level library navigation the participant searches the links and then focusing on the library search box. Towards the end of the recorded task the participant gazes across the lower portion of the screen and browses the library events and small graphics for library advertising. The participant can be seen taking her eyes off the website screen and onto the desktop background of the moderator’s computer. The participant was very vocal in her think aloud and was unsure of where to even begin to look for such information for the task or what type of link she was looking for. This participant rated the task a 2 or very difficult on the rating scale.
Participant 5:

Length of time on task: 1 minute 13 seconds
Number of fixation points: 27

This participant’s gaze plot looks like a short, upside down “F” formation with a stray fixation spot towards the bottom right of the screen off the website and looking at the desktop background. This participant was unique in that he never fixated on the top level site navigation, only the mid level library navigation. He clicked on several tabs looking for information to complete the task finally landing on the “Ask Us” information. The participant focused on the library search tool many times, but always went down to the links just below the search to focus in on the information he was looking for.
Summary of Data

All of the participants had a very difficult time with this task. The four out of five participants who did not complete the task gave up rather quickly on the task. The majority of the participants focused their gaze on the mid level library navigation, the search box to find books and the centrally located links about the library resources and materials available to Kent State University students. What is clear from this task is that participants spent very little time browsing any information below the mid level library navigation. 70% of the participants focused their gaze on the yellow formation searching the search box and surrounding area for clues and information on how to complete the given task.

This heat maps show the central point of focus for the participants in the first five seconds of the task. The hot spots include the library hours in the upper level navigation towards the right of the screen and the links just below the mid level library navigation search box.
Task Critique

The task given to the five participants show their lack of understanding of the question at hand and the difficulty of the task. Retrospective think alouds would have given more clues as to why the students had so much difficulty finding what they were looking for and what steps they would have taken to finally complete the task. This task is something many students would not actually think of completing on the library website. Most college-aged users would need the online articles and need to find books the library holds in the collection. Faculty may have an interest in suggesting titles for purchase for their classes, research or because they authored the particular title. Three tasks that would be good for eyetracking web usability on the library homepage for college-aged participants include:

1. You are working on a research paper and need a book on your topic. Find a book that is available in the library collection using the library homepage to search for the item. (Qualitative)

   Feedback: How satisfying was it to work on this task from a scale of 1 to 7 with 1 being very satisfying and 7 being very dissatisfying?

2. Go back to the library homepage from your current webpage. (Quantitative)

   Feedback: How confident are you that you completed this task on a scale of 1 to 7 with 1 being very confident and 7 being not very confident at all?

3. You are looking for an article that was cited by an author. Find the article on the library webpage. (Qualitative)

   Feedback: How easy or difficult was this task on a scale of 1 to 7 with 1 being very difficult and 7 being very easy.

These tasks would look at multiple areas of the website and focus on tasks the students would find relatable to them as students. The qualitative and quantitative data would help the design team decide how usable the library resources are and paired with the eyetracking would determine how quickly the participants focus in on the right parts of the website.

Conclusion

Eyetracking data provides valuable feedback many participants and moderators would be unable to verbally explain otherwise. This type of capture hardware and software gives a new perceptive to designers and informs the way websites are organized and give information architects qualitative data to make decisions about the behaviors and actions of users in a specific group.