

UX of the DVC Library Website

Gabriel Valle

Diablo Valley College

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Introduction

This study was conducted to assess the usability of the newly reformed Diablo Valley College (DVC) Library Website. The main goal was to compare users' interactions with the website to the intended behavior to identify usability flaws and sensibly suggest further improvements of the site.

Methodology

Participants

Participants in this study consisted of DVC affiliates, including students, student workers, staff, and professors. The total sample included 12 participants, ages ranging from 18 to over 55, and 1 librarian.

Measures

Participants were asked to attempt 6 designated tasks using the DVC Library Website, library.dvc.edu. Observers timed each task and recorded the steps taken when attempting to complete them, whether the task was completed successfully, and any barriers encountered. Participants were encouraged to voice their actions to facilitate the recording process. To prevent frustration, participants were asked to move to the next task when unable to complete it within 5 minutes. This time constraint was not disclosed to participants to discourage urgency. After the tasks, participants were asked to give feedback on their experience, including task difficulty, current feelings, and any additional comments or suggestions. Demographic data, such as age, was also collected. One librarian was tested to provide an ideal task completion time for comparison. The following data points were collected from each participant:

- Task completion (per task)
- Time to completion (minutes)

- Attempted steps
- Age

Tasks

Tasks were based on realistic scenarios reflecting common use cases of the website. For each task, a set of potential steps was designed to highlight possible intended solutions.

Additionally, a script was coded to compare each participant's set of steps with the set of intended steps for every task. The 6 tasks are displayed below with their completion steps.

1. Find out how late the SRC Library is open on Thursdays (Figure 1).
2. Reserve one of the study rooms at the Pleasant Hill Campus (PHC) Library for 2 hours next Saturday (Figure 2).
3. Find if the book *A World of Ideas* by Lee A. Jacobus is available to be borrowed from the DVC Library (Figure 3).
4. Submit a request for the book *Private Gardens of the Bay Area* with pick up at the San Ramon Campus Library (Figure 4).
5. Contact the library to ask questions about an event (Figure 5).
6. Find 1 academic source on the Impact of Climate Change in the Arctic in the Academic Search Complete database (Figure 6).

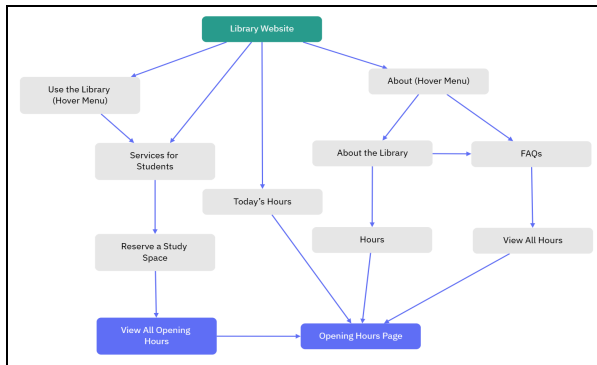


Figure 1

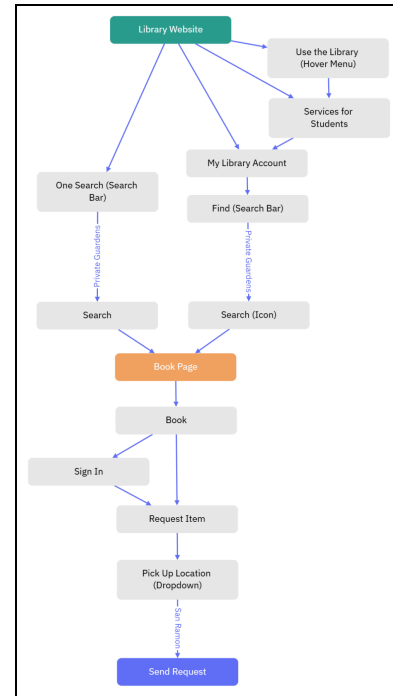


Figure 4

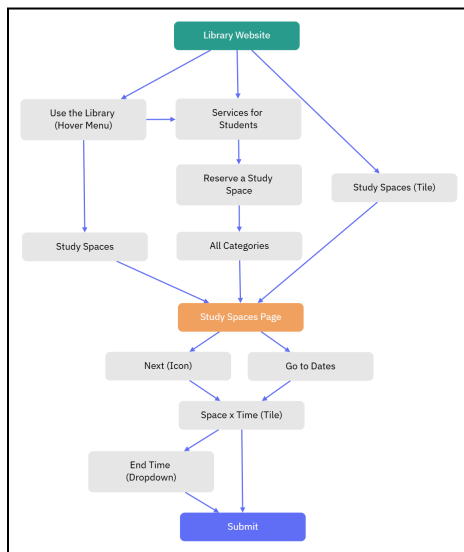


Figure 2

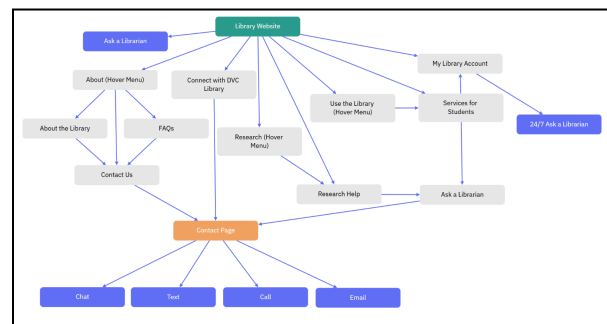


Figure 5

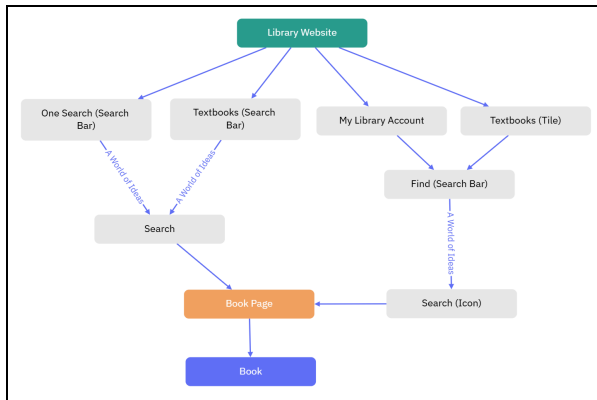


Figure 3

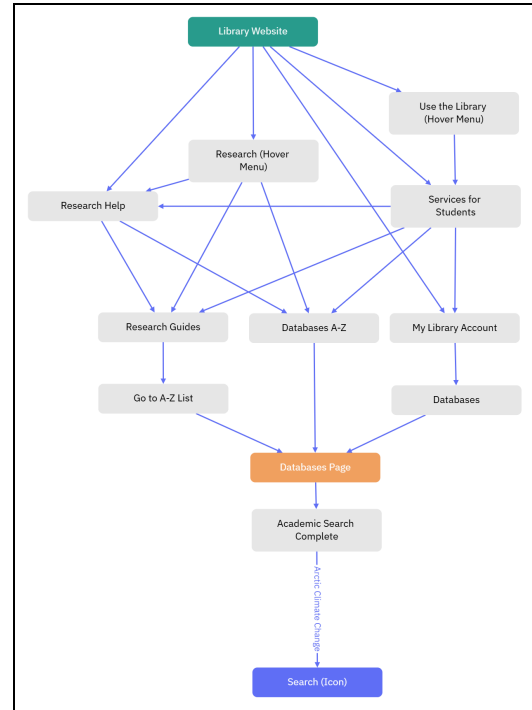


Figure 6

Results

Overall task completion was relatively high, with an average completion rate of 77.78% (Figure 7) and a mean completion time of 2.61 minutes (Figure 8). However, the results indicate some variation in completion rates across tasks. Task #5 was completed most successfully, with a 91.67% completion rate, although it also required the longest time on average at 3.05 minutes. By contrast, Task #4 proved to be the hardest, with a completion rate of 66.67%.

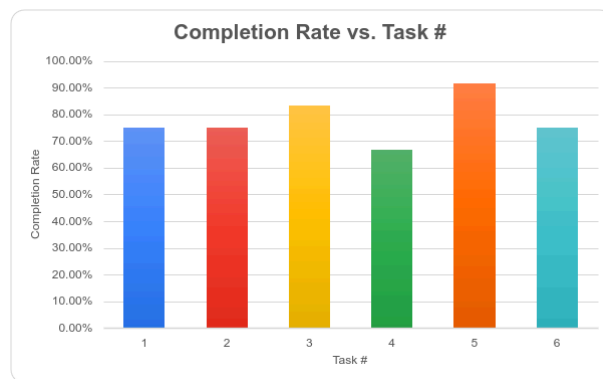


Figure 7

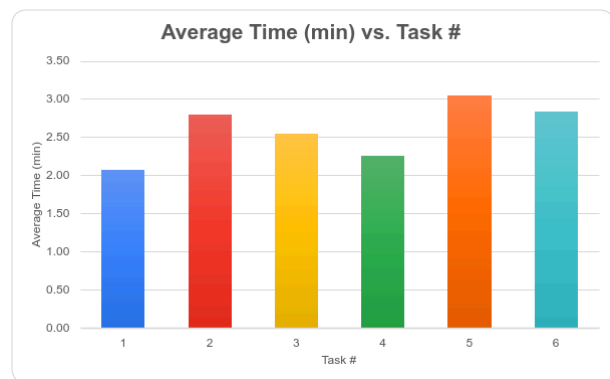


Figure 8

Analysis by age group demonstrated significant differences in both completion rate (Figure 9) and average completion time (Figure 10). Participants aged 15–24 achieved the highest completion rate at 86.67% and the fastest average completion times with only 2.10 minutes. By contrast, participants aged 35+ had a lower completion rate at 66.67%, with participants in the 55+ group demonstrating slower performance, averaging 3.86 minutes.

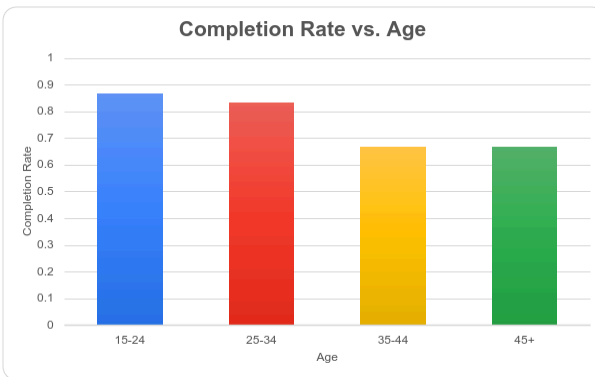


Figure 9

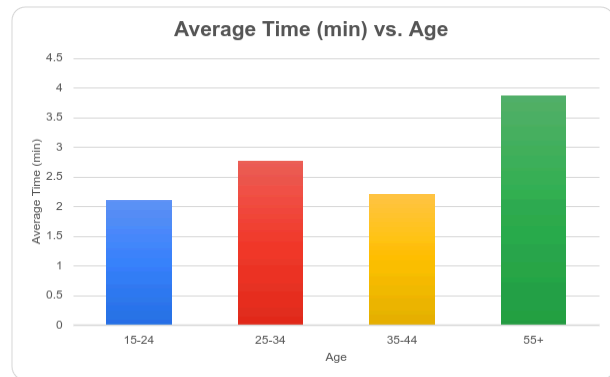


Figure 10

Completion times were concentrated in the 1-2 minute and 3-4 minute ranges (Figure 11). Despite a relatively low completion rate, Task #1 was completed 56% of the time within 1-2 minutes (Figure 12). Task #5 displayed the widest spread of times, including the highest percentage exceeding 5 minutes at 27% (Figure 13).

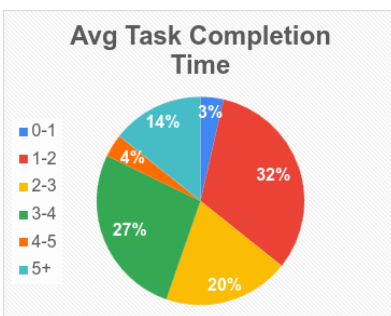


Figure 11

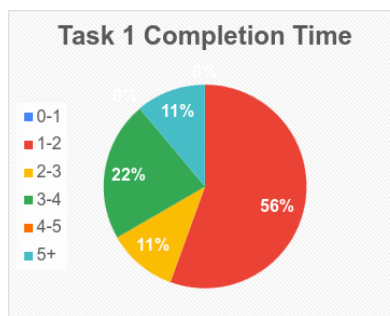


Figure 12

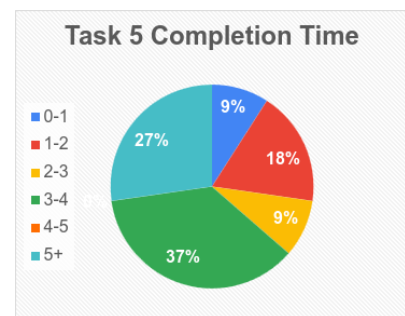


Figure 13

Analysis of participants' steps per task reveals a trend in completed and incomplete tasks (Figure 14). Completed tasks tend to have a higher proportion of valid steps, while incomplete tasks tend to have more invalid steps. Task #4 required the highest number of valid steps to completion, averaging 5.75. Task #3 displayed the highest number of invalid steps for both completed and incomplete tasks, at an average of 3.3 and 6.5 invalid steps, respectively.

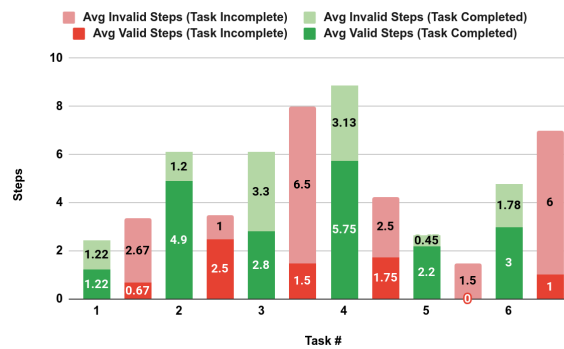


Figure 14

The librarian data establishes an ideal completion time rate (Figure 15). Notably, Task #5 required the least time to complete, at just 10 seconds. By contrast, Task #2 was the longest, albeit remaining under 1 minute.

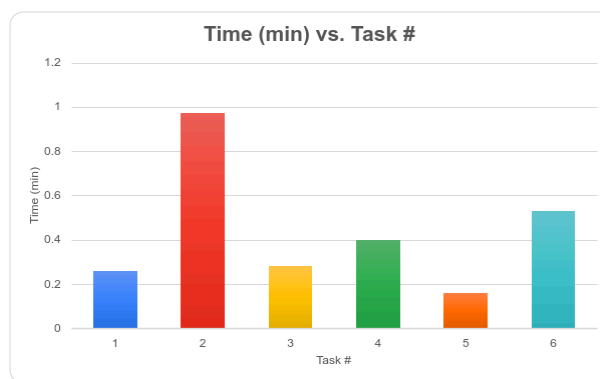


Figure 15

Discussion

Considerations

Some considerations should be addressed before interpreting the results. First, there was some discrepancy in timing and rounding, with some recordings rounding to the nearest minute, as well as rounding when converting from seconds to minutes. These practices may have caused minor inaccuracies. Second, implied steps were added in cases where participants did not return to the home page before starting a new task. This may not accurately reflect how they would have navigated otherwise and may also have affected their completion times. Third, some tasks may appear misleadingly longer than in practice. For instance, Task #5 required contacting the library and produced longer times when participants decided to call compared to other options. Finally, some steps may not reflect their classification, as some participants went through unanticipated (sometimes exploitive) but reasonable steps, which were nonetheless marked as invalid steps.

Analysis

The usability testing of the DVC Library website produced an overall high completion rate, indicating that most participants were eventually successful in completing the tasks. However, closer examination of individual tasks and isolated steps suggests recurring issues with navigation, terminology, system defaults, feedback, and visibility.

Task #1, finding library hours, produced frequent navigation errors despite a high completion rate. Many participants initially searched under “Visit the Library” instead of “Today’s Hours,” indicating a labeling and expectation mismatch. The page resulting from the link “Visit the Library” failed to follow standard conventions in which users were expected to find the establishment’s operational hours. Additionally, the label “Today’s Hours” failed to convey broader hour information, implying the presence of only the current day’s schedule,

despite that not being the case. This violates Nielsen's heuristic of "consistency and standards," which emphasizes that systems should use familiar terms and categories (Nielsen, 1994).

Task #2, booking a study room, was one of the most time-consuming tasks and the most one among the librarian benchmarks. Participants were often deterred by the default setting of having midnight as the start time and the constraints on time selections. It is unreasonable to force users to begin navigation at a point where no meaningful actions can be taken, at a time when the establishment is still closed and no rooms are available to be rented. Participants were also met with some inflexibility towards time selection, where the initial selection had to be made using the tile system; however, any adjustments were made using a dropdown at the bottom of the page. Without any indication to scroll down, some participants reloaded the page to clear their selection and started over. Another byproduct of having crucial information hidden at the bottom of the page, such as labels and the submit button, was some participants reporting uncertainty towards their selections and about whether their actions succeeded. These challenges illustrate Norman's principle that systems should provide clear signifiers to guide users toward intended actions (Norman, 2013).

Tasks #3 and #4, which involved locating and requesting books, produced the highest number of invalid steps. Participants frequently navigated to the "Borrow Library Materials" menu, assuming books and options to request them would be located there. Some participants also mistook the meaning of "interlibrary loan," ultimately filling out the request form. Additionally, the request button is concealed until after login, prompting participants to mistakenly assume that they were on the wrong page and some to give up entirely. Here, the opaque terminology and hidden features led to systematic misunderstandings, which Nielsen (1994) identifies as violations of "visibility of system status" and "error prevention."

Task #5, contacting the library, had the highest completion rate but also the longest average completion time, which can be attributed to varying choices of communication methods. A point of confusion was the unlabeled icons. Although the icons were intuitive, the functions tied to them were often not. For instance, some participants expected the phone icon to lead to a page displaying the library's contact number, but instead it attempted to open a phone application. This worked only for mobile users and left desktop users confused. A mismatch between user expectations and system behavior reflects Nielsen's (1994) heuristic of "match between system and the real world," where symbols must not only be recognizable but also produce outcomes aligned with the user's context.

Task #6, locating a database, was marked by a high number of invalid steps. The OneSearch bar appeared to be the universal entry point to all queries; thus, several participants attempted to use it to access databases. Among books, the results also returned database articles, resulting in many participants not realizing that a dedicated "Databases" page existed and instead persisting with OneSearch. This reflects Nielsen's (1994) principle of "recognition rather than recall," as the system required participants to recall the existence of a separate database page rather than making it easily discoverable.

Most tasks could be completed with a library account login, which provided a potential alternative solution path. Interestingly, no participant attempted to log in during the study, even though doing so could have simplified access to certain functions such as book requests. This avoidance can be attributed to a lack of visual consistency, where the login button was not integrated in the same way as others. As Norman (2013) notes, critical system functions must be both visible and consistent to facilitate their discovery.

Finally, demography analysis demonstrated a completion rate and average time disparity between younger and older participants. Younger participants were more adaptable to design flaws, having a higher completion rate and lower compilation time, suggesting that design issues burden older and less digitally fluent users more heavily. Interface design and function should maintain a simplistic approach to better support inexperienced users while also providing efficient approaches to younger, more experienced ones. This balance reflects Nielsen's (1994) heuristic of "flexibility and efficiency of use," where systems should provide multiple solution paths that address diverse user skill levels.

Recommendations

Based on the findings of this study, there are several recommended design changes to improve the usability of the DVC Library website.

Firstly, the manner in which library hours are presented should be clarified. The current label, "Today's Hours," misleads users into thinking that only daily information is presented. Relabelling it to "Library Hours" would correctly reflect its function and help users more easily locate weekly and seasonal schedules.

The study room booking system would also benefit from layout and default adjustments. Showing the first available booking time instead of defaulting to midnight would reduce confusion and wasted time. Additionally, supporting drag-to-select functionality and moving legends to more visible areas would reduce navigation errors by better aligning the system with user expectations and increasing user confidence in their selections, respectively.

Book requests should be more apparent, with a dedicated title label and a visible button that prompts the login screen instead of being concealed until login.

Contact icons' functionality should match their expectations across devices, so that clicking on the phone icon on a computer shows the library's phone number rather than attempting to launch a calling application.

Lastly, the "My Library Account" button should be standardized and made more prominent. Highlighting this feature would introduce a new, consistent path to solving most library tasks.

Conclusion

[ADD]

Acknowledgements

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References

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