Turning Students On To Your Library's Web Site: using web site usability techniques to improve student use of your library's site

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Abstract:
This paper will introduce the concept of web site usability, provide a brief introduction to the techniques and offer examples from two "real life" studies that show how the techniques of formal usability studies, focus groups, and card sorts can be used and offer tips and tricks for employing these techniques.

Introduction

Since the advances of the Internet in the early 1990s, students, including university students, have embraced this new method of searching for information. Libraries have been using the Internet to provide scholarly resources to students. Also due to the often complex ways of finding information using library resources and the ease and rapidness of using Internet search engines, students tend to use the Internet first and libraries second when searching for information, even when it needs to be scholarly.

Students, unfortunately, often find the information they need in a shorter time using search engines; they also find the search engines easier to use and their web pages more appealing. McMullen (2001) stated that a usable web site is essential, as it is the interface between the "information professional and the individual who is seeking information" (p.7). Library web sites are often designed in a similar manner to libraries rather than in a "user-centred" manner. A web site must be designed for users of the site, not for the librarians or the creators (Dickstein and Mills 2000).

Web site usability techniques can be used to produce web pages that are easier for the average library user to navigate and to make the pages more appealing. The increase in distance learning and remote users necessitates additional concern about the efficiency and effectiveness of a library's web site (Cockrell and Jayne 2002).

This paper will discuss the concept of web site usability, provide a brief introduction to the techniques and offer examples from two "real life" studies that show how the techniques of formal usability studies, also called task-based testing, focus groups, and card sorts can be used. It will also offer tips and tricks for employing these techniques.

Web Site Usability Techniques – What and How

The concept of "usability" began with computer software companies in the 1980s when they began to see their products as needing to be user-centred rather than designer-centred. Conyer (1995) stated that the users' experiences with a product or web site are the best tests of quality. "Average" users were polled and questioned about the "usability" of the products.

Usability has a number of definitions. A "usable" web site is defined by Rubin (1994) as being useful (doing what the user wants it do), effective (ease of use to achieve user's goals), learnable (ease of moving from novice to skilled user) and satisfying (how enjoyable the interaction was for the user).

Web site usability involves inquiry, inspection and formal usability studies. Inquiry techniques involve users' perceptions and opinions, while inspection techniques look at sites from the users' perspectives. Formal usability studies involve direct observation of users. Inquiry techniques include formal usability studies, card sorts, category membership expectations, focus groups, one-on-one interviews, questionnaires and surveys. Inspection techniques include cognitive walkthroughs, heuristic evaluation and log analysis. In this paper, only formal usability studies, focus groups, and card sorts will be defined and discussed.

Formal Usability Studies

Formal usability studies, also called “task-based testing”, utilise the observation of users completing tasks on web sites. The basic elements of formal usability testing involve real users performing real tasks on a page or site, usually with a moderator and often an observer (Campbell 2001). Observation can be either direct (in the room) or indirect (through one-way glass, screen captures, video recording etc.) or a combination of both. There is usually a moderator, except in completely indirect observation. The moderator’s role is to help the participants feel comfortable and prompt them back when they get too lost or leave the site that is under evaluation. Other than the occasional prompt and announcing when the participant has found the correct answer, the moderator should not interfere with the test.

Most of the literature recommends 8-12 tasks for a 1.5 hour test time (Campbell, 2001). Another half hour is often taken up with welcoming the participant, introducing the purpose and methodology of the test, the post-test questionnaire and good-byes. The post-test questionnaire is often used to identify participant demographics and collect general satisfaction with the test and the site.

There is some debate in the literature concerning timing the questions. Most of the literature suggests three minutes as the maximum for each task (Campbell, 2001), while some authors offer the idea that letting the participants continue searching until they give up is the best (Norlin and Winters, 2002).

Focus Groups Defined

The focus group technique has been used widely across a variety of disciplines for a number of years. It can also be referred to as “preference testing”. In usability testing, small groups of users, between eight to twelve, are gathered together. Both a moderator and observer are usually present. The group is asked a series of questions, often open-ended, which lead to information on the usability of the web site. There are frequently eight to ten questions. Questions usually take the form of “what made this web site easy to use”, “what made this web site difficult to use”, “what would make this web site more useful to you” etc. Focus groups usually last one and half to two hours. Canning (1995) described focus groups as a cost-effective and quick means to elicit relevant information about services and resources.

Card Sort and Category Membership Expectation Defined

The Card Sort technique involves using index cards with one link on each, either using labels or printing directly on the card. Participants are asked to put the cards into categories. Usually, participants are asked to add additional links (either duplicates that they want in more than one category or links that were not included in the original decks). Participants are also often asked to provide names for the categories.

Category membership expectation is similar except that the names for the categories are already decided and participants are asked to put the cards into whichever category is closest to where they “expect” the link to occur. Some people also allow participants to suggest alternative names for the categories and to create additional categories.

The University of North Texas Experience

We have performed two web site usability studies. The first one was designed to be a beta test for the home page study which is currently ongoing. The Ask A Librarian sub site was used for the beta test and we utilised the techniques of formal usability studies and focus groups. The home page study included the above techniques as well as a card sort.

General Information

While the literature (Rubin, 1994) supports the use of fewer participants, we chose to test with thirty participants. We did this for several reasons:

- we wanted to divide the thirty into three groups of ten, one each of graduate students, undergraduate students and students with online learning experience
- we were interested in gathering data that would be useful for distributing to others through papers and presentations
- we wanted to ensure that the data would stand up to scrutiny, such as that from colleagues who were less learned in web site usability studies and would find accepting data from four to five participants difficult; and,
- we were interested gathering data to determine if there were any race, gender, and English as a second language (ESL) effects as well.

We were able to solicit funding to pay the participants ten dollars an hour. An advertisement was posted through our Human Resources department as required by the funding source. There were no issues with the testing of human subjects as all the techniques are considered to be non-invasive. Participants were accepted on a fairly first-come, first-served basis until categories were nearly filled. After this, I attempted to fill in the gender and race gaps. I also worked to ensure that there was a variety of disciplines included. Both studies ended up with the undergraduate and distance learner categories having an equal distribution of gender, and the graduate students being 60:40 for males:females. There was also an acceptable mix of disciplines, races and ESL students.

Our team consisted of three librarians, all of whom serve on the web committee. We made a deliberate decision not to involve anyone else for the beta test. While this decision allowed for consistent data collection and easier organization, it did tax our time resources. For the home page study, we asked for volunteers from across the library. From the response, we chose eight volunteers, who were assigned to specific time slots for the formal usability studies and focus groups.

Formal Usability Studies

Question design

The questions were designed to have participants use the site pages to answer the questions. Due to the breadth of our site, we were unable to find questions that had only one direct path. Questions on the Ask A Librarian site tested the ability of participants to find all the services offered from the site, while the questions for the home page study focused on the most common uses of the site. There were eight questions for each of the studies.

Beta testing

We beta tested the sub site questions on one of our graduate library assistants and discovered that it is best to test across all levels of users. Since we included undergraduates, graduates and distance learners, we should have tested three people who matched these categories. While this did not affect the study, it would have helped to have prompts developed prior to beginning the test. We found that many of the questions needed a standard prompt for most participants, possibly due to the relatively high number of ESL students.

Location

We chose a small room that had a table for the post-test questionnaire process as well as the necessary computer. Following the advice in the literature (Collins and Aguinaga, 2001), we decorated the room with several posters (thoughtfully provided by electronic resource vendors), a small vase with fake flowers and some artwork by my six-year-old daughter. These decorations not only served to detract from the "test" atmosphere, but also served as conversation pieces to build rapport with the participants.

Equipment

Participants were given an option of using either Internet Explorer or Netscape as suggested by the literature (McGillis and Toms 2001). Out of the sixty students over both studies, only three exhibited a preference for Netscape. Almost half did not have a preference so we used Internet Explorer in these cases as it tends to work better on our machines.

For the Ask A Librarian sub site, we used a moderator, an observer and WinWhatWhere recording software. The WinWhatWhere program worked well; however, for the home page study, we decided to use video capture software from Camtasia. The use of video capture was extremely effective in our case. We were comparing our home page to three other academic library web pages, and the observers had difficulty following the participant on the other pages. In order to get complete data, we reviewed at least half of the videos. Screen videos also serve to enhance presentations of the data, as those who were not present can still see the problems participants had with the site.

An audio tape recorder was used during the Ask A Librarian task-based testing, as we asked participants to "think aloud" in order to let us know why they made their pathway choices. Walbridge (2000) notes that the think-aloud reveals thought-processes of users, especially how well they are understanding what they see. Several participants were able to do this, while many found it too difficult or distracting. We chose not to have an audio recorder for the home page study, as it proved of little value for the previous study and any comments that participants did provide were easily recorded by the observer.

Structure of test

The test was run in a block of two hours with one participant per session. For the Ask a Librarian site, the average time was twenty minutes, while for the home page study, the average time was one hour. We allowed a maximum of three minutes per question although Gullikson et al. (1999) suggest that if participants do not find the answer in one minute, they will not be successful at all. Our studies have not supported this. Battleson et al. (2001)

allowed three minutes as the outside marker, but used three incorrect choices as the time to intervene.

All of the Ask A Librarian sessions and most of the home page sessions had a moderator and an observer. Approximately a third of the home page sessions had only a moderator, due to the timing of the tests, usually after normal working hours. We chose to use an observer, as well as tracking software and screen capture, to reduce the amount of video viewing that we had to do, and also to facilitate the recording of body language. McGillis and Toms (2001) and Allen et al. (2001) used tracking software exclusively. Battleson et al. (2001) note that rotating the moderators and observers reduced the test bias but increased variability in the results. We chose to have a single moderator and several observers on a rotating basis. Although this is a significant time commitment for the moderator, we found it useful to provide continuity across the data gathering.

Refreshments

Although the participants were paid for their time, we believed it was important to provide some form of refreshment for them, so we provided chocolate bars, candy, and water. The refreshments were important as some participants were “down” after the test was finished. An unexpected treat served to pick them up and encourage them.

Running the test and the post-test process

Participants were welcomed and introduced to the purpose and process of the tests. Tasks (questions) were printed out on sheets of paper. We asked participants to read the question out loud to stimulate the “think aloud” activity, as suggested by Battleson et al. (2001). However, our participants did not continue to talk aloud during the tasks. We asked the participants to return to the home page between tasks, in order to facilitate question analysis with the tracking software and videos (Battleson et al. 2001).

After the test, participants were asked to complete a short demographic questionnaire with additional debriefing questions on the test process and their likes and dislikes of our web site. Rubin (1994) notes that the debriefing portion can be the key to fixing the problems indicated by the study results. The informal comments provided were often enlightening (Battleson et al. 2001), possibly because the "test” had concluded. Walbridge (2000) noted that debriefing offered a chance to provide some information literacy training for the participants.

Data collected

For our results, we collected the success rate (yes or no), time taken (three minutes was the maximum), pathway (route), and number of clicks (we did not count backing up or going directly to the home page). We calculated the number of clicks over the ideal pathway (for each possible route to the answer) and the average time to find the correct answer (using the average of clicks and time from one undergraduate student, one graduate student and one online learner not involved in the study). This was especially important for the home page study where we were studying three other home pages as well as ours.

Focus Groups

Scheduling and set up

We planned for six focus groups, two for each category, and ended up with seven for the Ask A Librarian test and eight for the home page study. Groups were scheduled in the morning and the afternoon. We used a moderator and an observer. Sessions were audio-taped after the consent of all participants was obtained.

Room choice and preparation

From the initial test of the Ask A Librarian sub site, we discovered the importance of selecting a room that encourages a free flow of discussion. Some of the literature recommends decorating the room to do this (Collins and Aquanga, 2001). We did not decorate the room as it was in use between the sessions, and the room we had chosen was a darkish brick with a long conference table. We observed that participants were less loquacious during the focus group than they were in the task-based testing. This was considered odd as the "testing" atmosphere of the formal usability study usually provides for a less comfortable experience for the participants. Often participants are more relaxed in a group situation than with a one-on-one interview style (Canning 1995). In our second study, we used the same room as the formal usability studies. It was much smaller, and, for one focus group where we had six participants and two observers, a bit crowded. However, participants were equally or more voluble this time.

Refreshments

For the Ask A Librarian study, we provided mini-muffins, cookies and water. These were not particularly popular, and ice for the water would have been useful. However, the room was in an inconvenient spot to carry food and food-related products into the Library as food is not allowed in the Library. The room for the home page study was in a smaller branch library and it was easier to bring in food. We provided chocolate bars, candy, cookies and water. Chocolate bars and candy were more popular.

Equipment and set-up

We decided to provide a printout of the questions and allowed space to write down comments. This ensured that participants who preferred to read the questions rather than hear them had that option. The room to write comments provided a forum for participants who had information that they didn't want to share with the group or didn't have time to share. We also provided pens to ensure anonymity.

The majority of the participants in both studies did not use the comment sheets. However, in the home page study, several participants, who were in groups where common opinions were less frequently shared, used the comment sheets to emphasize their opinions. I believe that offering these comment forms is well worth while. It would be more environmentally friendly to only produce a third to a half of the number needed over all participants, especially since many sheets were able to be re-used.

We used an audio tape recorder for the Ask A Librarian study; however, we did not use the tapes and chose not to record the home page study sessions. Both a moderator and an observer were used for all sessions. We used a single moderator to ensure data consistency.

Structure of sessions

Sessions were set for two hours and this was sufficient. Due to scheduling issues, we often only had four participants rather than the expected five, which may have worked out given the size of the table and room we were using. One session had only one participant as she was working three jobs and it was difficult to schedule her. We usually conducted two sessions a day.

We began the sessions by briefing the participants on the purpose and expectations from the groups, as well as explaining the rules of confidentiality and respecting the opinions of others. Participants then briefly introduced themselves. For the Ask A Librarian site, we went question by question, eight questions in total; however, due to the similarities in the questions for the home page, the moderator allowed the participants to share comments as they thought of the ideas. This seemed to work just as well as keeping the comments in an order.

For the first question in each study, we went around the table in a round-robin system so each participant had an opportunity to vocalize their comment. After the first question, we opened it up to free-form conversation. Some of the shyer groups continued to move in a semblance of the round robin, while other groups began conversations with each other. The moderator kept a careful eye to ensure that all participants had an equal opportunity to speak and that the rule of respect was kept. Overall, the free-form dialog was successful and I would recommend it for small groups. With larger groups, it may be more difficult to provide equal comment time for all participants.

Responding to questions

Traditionally, the moderator is not supposed to respond to comments or offer answers to questions in focus groups. We chose to answer or comment on quick factual questions. For example, participants in nearly all of the seven Ask A Librarian focus groups asked why the library does not have a way to renew books online. We would respond that there is a form and provide a pathway to it. We chose this option as it allowed us an opportunity to “teach” students necessary information (Walbridge 2000). Questions such as the example allowed us to emphasize why usability studies are so important. Since participants were looking for something that did exist but couldn’t find it, our site has some flaws. Allowing participants to free think on comments on the site provided us with highly useful information. We also found that some level of interactivity enhanced the rapport with the participants. Responding to some concerns at the point of need increased participant satisfaction, as judged by their parting comments. Answering their concerns, where possible, also showed that the Library was interested in their needs, not just in gathering data.

Screen shots

We discovered during the Ask A Librarian focus groups that screen shots of the relevant pages would have been helpful to aid the participants’ recall. As we were familiar with the pages, we were able to assist the participants in most cases. Using this experience, we ensured that we had screen shots for the most-used pages for the home page study. It was

essential to have the screen shots, as we were looking at three other academic library home pages. We provided screen shots of the home pages, databases/indexes pages, electronic journal pages, and other pages if needed (Ask A Librarian, Interlibrary Loan etc.). We produced ten copies of the screen shots, but needed another five by the end of the sessions.

The use of screen shots also allowed participants to note things they had not noticed during the task-based testing. This was especially useful to review our thoughts on what design elements worked and which ones did not. For example, on our home page there is a big green "send us a comment" button which only a few participants noticed during the study.

Card Sort

Preparing for the test

The card sort was used on the home page study. We prepared eight decks of index cards labeled with links from the secondary pages of our site for a total of 101 links per deck. Half the decks were pink and the others were blue which was useful as we had participants scheduled together at various times. We allowed one and a half hours per test although the average time was approximately forty minutes.

Some students were scheduled together, as we were becoming pressed for time towards the end of the study. This worked well; participants did not work together or seem distracted. There was even a pair of participants who were a couple, yet had very different results.

Conducting the test

Participants were asked to put the cards into piles that were related. They were able to add duplicate links and other links that were not included in the deck. We used white index cards to prevent confusion with the original links. Participants were also asked to name the categories. An additional task was to lay out the piles in the order or design that they would like to see on the home page. Naming of the categories and designing the home page were less successful than the actual categorization.

A number of participants used the links that we had on the cards as category names, which wasn't necessarily a problem, although many used "library catalog" for collecting such things as the "catalog", electronic resources (databases and electronic journals), interlibrary loan etc. For the first three participants, I included the site map to show where the links came from. However, this resulted in the participants following the site map too closely.

Summary

We would recommend going through even a small beta test with each new technique as there is much to be learned from actually using the techniques. We have found that most of what we gained from using the techniques is not always in the literature. There are often situational factors involved, from room size and layout to types of participants, and these can affect how a technique is applied. Having experience with two other universities, I can add that students at the same university can have similar characteristics and those characteristics can be different from students at other universities. These "situational" characteristics are generalisations but can make a difference to studies.

Web site usability studies are a fairly cheap and easy way to improve library web sites. Using actual users, or at least those who should be users, of the web site reveals valuable data about the site. User-centred data prevents or reduces internal arguments among web committee members. The data provides hard evidence to justify modifying or re-designing the site or individual pages.

An additional benefit of web site usability studies is the interaction with the users. We found that the participants were impressed with being able to offer their comments. Participants also went away with some information literacy training and the knowledge that the library is interested in them. Having users who believe the library is a “good” place can overcome some of the frustration with the complexity and enormousness of the library. User-centred web sites will bring users back to the libraries and not only justify the cost of the resources we have but, more importantly, assist our users with their scholarship and learning.

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