Improving Student Success: 
Researching How Students Use 
Electronic Library Resources

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Ethnographic and Qualitative Methods
online class 2010
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Research Conducted for:
the UNT Libraries
Executive Summary

- The majority of participants reported their experience level with online academic research as high.

- The majority of participants reported their ability to conduct online research as high.

- A majority of students prefer to conduct online research in the evenings from home using the laptop with a DSL/BB connection and Firefox browser.

- A number of students own application-enabled devices (e.g. smartphones) and desire for a UNT mobile application for quick searches.

- Graduate students were more likely to be aware of the various UNT electronic resources than undergraduates.

- The most commonly known UNT electronic resources were the e-journals and search databases, and the least commonly known were online tutorials and workshops.

- The majority of participants were given in-class or in-library instruction, which was how most participants learned about the UNT electronic resources.

- The preferred way to receive news and updates was via e-mail, while the preferred ways to learn about the resources were in-class or in-library instruction and online or in-person tutorials and workshops.

- Many students lack adequate knowledge and skills to conduct effective research.

- Students’ own inexperience causes them frustration in the research process and prevents them from utilizing the UNT electronic resources that are available to them.

- Lacking the skills for in-depth research, students turn to user-friendly search sites such as Google, Google Scholar, or Yahoo.

- Those students possessing some research savvy tend to favor particular databases and access those through other channels if not available through UNT.

- The UNT electronic resources site is valued for its breadth and depth, as well as the credibility of sources offered. Ultimately, users feel confident that the robust resources available ensure they will be successful in their resource searches.

- While the depth and breadth of the web site is greatly valued, it also is a barrier to successful searching for those less familiar with the site. The site is viewed as overwhelming and somewhat intimidating, especially for those newer to the site.
• Users' lack of familiarity with specific site resources and features, as well as lack of experience with search overall, are frustrating barriers that students may or may not acknowledge as actual barriers. Many assume the error is with the site, when in reality, barriers are often caused by user error or lack of familiarity.

• When faced with a roadblock during the research process, undergraduate students were likely to change their topic or disregard an accessible resource. Many students were also likely to ask for help from a librarian or a fellow classmate.

• The overwhelming majority of students interviewed valued personal interactions with the librarians very highly.

• Students highly valued quick response time and/or 24 hour assistance.

• Many students noted that the libraries homepage was cluttered and suggested making changes to formatting and aesthetics.

• When performing searches on the libraries website, participants found the electronic resource webpage to be confusing and had suggestions for improvement.
In 2005, The University of Rochester Libraries pioneered the use of ethnographic methods to improve library services in a groundbreaking study. Since then, similar studies have been conducted in universities throughout the United States.

Unlike other research strategies, ethnographic methods provide researchers with an in-depth look at students’ knowledge, attitude and behaviors through observations, one-on-one interviews, focus groups, and other techniques such as photo surveys, mapping diaries, and design workshops. According to Susan Gibbons, who pioneered the use of ethnographic methods in libraries at the University of Rochester in 2003, “The qualitative data that RCL has collected through its three work-practice studies has proven to be tremendously powerful in ways that the quantitative data (e.g., ARL statistics) have not. Significant changes have been implemented to RCL’s services, facilities, and digital presence to address deficiencies that the quantitative data could not adequately articulate” (Gibbons 2009).

The University of North Texas (UNT) Libraries has partnered with the Department of Anthropology at UNT to conduct ethnographic research of how UNT students use the electronic library services.

**Research Goal:**
To investigate how students at the University of North Texas use electronic library services.

**Major Research Questions:**
1. To create a profile of the typical library user, including student career, external obligations, work style, and technology use.
2. To investigate students’ knowledge of and learning about electronic library services.
3. To investigate students’ behaviors regarding electronic library services.
4. To investigate students’ needs regarding electronic library services.
5. To investigate students’ preferences regarding electronic library services.

**Methodology and Sample**

The research population includes all University of North Texas students. The sample was selected using convenience sampling. Any UNT student was eligible to participate. We refer to this research population as students and participants interchangeably in this report. Data was collected through 14 observations of UNT students during their use of online resources to conduct research, 28 semi-structured interviews, and 7 focus groups.
The gender distribution of the sample was 28 males and 30 females. Specifically, interview participants consisted of 7 males and 21 females, and observation participants included 4 males and 9 females. The focus group consisted of both males and females as well.

![Gender Distribution](image1)

The age distribution of the sample consisted of 19 participants less than or equal to age 26 and 33 participants over age 26. Particularly, among interview participants, 15 participants were less than or equal to age 26 and 23 were older than 26. In the observations, 4 participants were younger than or equal to age 26 and 10 participants were over age 26.

![Age Distribution](image2)

![Interviews vs. Observations](image3)

![Interviews vs. Observations](image4)
The sample was also categorized according to grade classification level. The study used four categories of class level: undergraduate lower (freshman and sophomores), undergraduate upper (juniors and seniors), master’s, and doctorate. The sample consisted of 15 undergraduate lower, 19 undergraduate upper, 13 master’s and 10 doctorate students. Specifically, in the interviews, 4 participants were undergraduate lower, 12 participants were undergraduate upper, 8 were master’s students, and 8 were doctorate students. In the observations, 1 participant was an undergraduate lower, 5 were undergraduate upper, 5 were master’s students and 2 were doctorate students.

Class Level

Figure 5

Figure 6

Participants were also categorized based on the college program they were enrolled in and where they lived. The most common college of participants was the college of Public Affairs and Community Service. The most common major of the participants was anthropology. The most common cities where participants lived were Dallas and Denton.

Figure 7: College Distribution
Profile of Library Users

This study also gathered information about students’ obligations outside of school and work schedules. Twelve students reported no outside obligations such as children, spouse, volunteer commitments. Thirty-six participants reported that they do have outside obligations. Thirteen participants reported working less than 20 hours per week, while 21 reported working more than 20 hours per week. Five participants reported being unemployed.

Participants’ course load and online enrollement was also profiled. The undergraduate students of the study carry an average of 11.5 hours per semester. The graduate students average 10.5 hours per semester. 92% of participants reported having taken at least one online course.

Twenty-eight participants indicated their experience level using the UNT Library website to conduct online research. In total, 18 of study participants ranked their experience level as high, while 10 ranked their experience level as low. Students were stratified by class into undergraduate lower, undergraduate upper, master’s, and doctorate level respondents. Figure 9 shows the distribution of each grade classification. Of the lower level undergraduates, 3 ranked their experience high and 2 ranked it low. Of the upper level undergraduates, 6 students ranked their experience high and 6 ranked it low. Of the master’s students, 4 ranked their experience high and none ranked it low. Finally, of the doctoral students, 5 ranked their experience high and 2 ranked it low.

Experience Level

Figure 8

Experience High 18
Experience Low 10

Figure 9

Experience High
Experience Low

Undergraduate Lower
Undergraduate Upper
Master’s
Doctorate

(number of students)
Participants were asked to indicate their level of skill at conducting internet research on a scale of one to five. Nineteen participants ranked their skill level as high, while 9 ranked their skill level as low. Responses were once again stratified by class level. Figure 11 shows the distribution of each grade classification. Of the lower level undergraduates, 2 ranked their skill level as high and 1 ranked it low. Of the upper level undergraduates, 7 students ranked their skill level as high and 5 ranked it low. Of the master’s students, 5 ranked their skill level as high and 1 ranked it low. Finally, of the doctorate students, 5 ranked their skill level as high and 2 ranked it low. The seemingly high response rate of lower undergraduates reinforces the possibility that smart-search engines like Google cause younger students to overestimate their ability level as discussed later in this analysis.

Skill Level

![Figure 10](image.png)  ![Figure 11](image.png)

Students were asked about any disabilities that might interfere with online research. Four respondents (13%) indicated a physical disability that interfered with internet research. Although not asked to elaborate on the specific diagnosis, 100% were associated with a visual disability of some type. Interestingly, two respondents (6%) indicated a disadvantage when asked about disabilities. One disadvantage was related to elder age and a general lack of knowledge of computers, while the other was related to a slow internet connection.

In terms of personal resources, all participants used a laptop. Forty-three percent also used a desktop, either at home or at the UNT Library. PC and Mac users represented 86% and 16% of respondents, respectively. One student used both a Mac (laptop) and a PC (desktop). Fifty-
eight percent owned a personal printer and 42% of the students used the UNT printers in the library or other buildings, such as the Art building. Of particular note is the 27% of students who proactively offered that they prefer to use the printers at UNT to save paper and ink at home, thus reducing their personal expenses. The interviews, focus groups, and observations did not ask this question directly so the true number of students who use UNT campus printers is likely much higher.

Firefox and Internet Explorer were the two most common browsers used though most respondents used multiple browsers, especially when the first choice failed. Unfortunately, the second choice of participants was not recorded. Nearly one-third of participants were using high-speed internet, DSL, or Broadband connections while another 21% did not know how to classify the connection. For example, one response was “Google.”

Students overwhelmingly preferred to use a laptop to conduct internet research, but a surprising 18% of participants utilize smartphones. Other personal devices owned, but not necessarily used for research included smartphones, MP3 players, video games, webcams, digital sound recorders, digital cameras, digital video recorders, DVD players, DVR recorders, and e-readers. Smartphones (32%) and MP3 players (30%) were the most common devices owned. Multiple participants suggested the development of a UNT Library application (an “app”) to use with smartphones that is discussed later in this analysis. The percentage of students who currently own app-enabled technology warrants such development.
Respondents overwhelmingly preferred to conduct internet research from home; yet almost one-third also conducted research from campus locations. Among the latter, the UNT Library was the most preferred (62%), followed by computer labs or buildings such as the Art Building (31%), and classrooms (15%).
Results and Analysis

Awareness of Library Resources

General Student Population (Undergraduate and Graduate)
The overwhelming majority of the total student population either demonstrated or directly cited a high degree of familiarity with the e-Journals (94%) and search databases (92%). More than half of our sample had knowledge of the e-books (67%), interlibrary loans (ILL, 60%), and full text (60%). Awareness of the thesis database (42%) was slightly below average, but awareness of the online tutorials (25%) and workshops (17%) was very poor (Figure 17).

Three of the 45 respondents indicated that they were not familiar with either the e-journals or the search databases, but during discussions it became clear that they had, in fact, already used them. This suggests a possible misunderstanding of the resource titles. Of the five students already aware of the online workshops and tutorials, only one actually used it.

Undergraduates
While the overwhelming majority of undergrads knew about the e-journals (81%) and search databases (84%), only a slight majority knew about the e-books (56%). Awareness of the ILL (41%) and full text (47%) were slightly below 50% of the sample, as was awareness of the online tutorials (33%). However, awareness of the online workshops (17%) and thesis and dissertation database (7%) was very poor among undergraduates (Figure 18).

Graduates
Graduate students, on the other hand, were well aware of virtually every resource, with 100% of respondents aware of the e-journals, search databases, full text, and thesis and dissertation databases. Awareness of interlibrary loan (92%) and e-books (70%) was also very high. The greatest lack of awareness among graduate students was with the online tutorials and workshops at 50% each. The differences likely reflect the differing work requirements for graduate and undergraduate classes (Figure 18).

Figure 17: Awareness of Resources

Figure 18: Awareness by Degree Level
How Students Learned About Resources

The majority of students learned about resources through their professors exclusively (33% undergraduate, 39% graduate), or from library orientations arranged by professors (26% undergraduate, 17% graduate). Only 15% of undergraduates and 17% of graduate students learned about the resources exclusively from a librarian. A very small percentage learned about the resources from classmates (4% undergraduate, 6% graduate) or online tutorials or workshops (4% undergraduate, 0% graduate) (Figure 19).

Figure 19: How Students Learned About Resources

Past Instruction

The majority of interview participants had in-library or in-class instruction. Only four of the 28 respondents had neither type of instruction and 12 had been given instruction both in the library and in the classroom. However, 9 of the 18 participants who had been given in-class instruction by their professors used phrases like “sort of,” “somewhat,” or “unhelpful” to describe the instruction. Unlike in-class or in-library instruction, very few of the participants used the online or in-person tutorials and workshops (Figure 20).
Degree Level Variations in Past Instruction Experiences

- Graduate student participants were more likely to have had each type of instruction;
- Graduate students were more likely to know about and use the online and in-person tutorials;
- PhD students were more likely than Master’s students to have had in-library instruction;
- Master’s students were more likely than PhD students to have had in-class instruction;
- Lower level undergraduates were less likely to have had instruction, but were more likely to be aware of and use the tutorials.

Ability Ratings and Past Instruction

Interview participants were asked to rate their level of experience, skill, and confidence in conducting online research. These ratings were classified into one of two categories: low or high. Those students who had high self-ratings in all three categories were the least likely to have had in-class and/or in-person instruction. Students who rated themselves high in at least two of these categories were the most likely to know about and use the online tutorials and workshops.

Preferred Learning Methods

The focus group and interview participants were asked how they would prefer to learn about the UNT electronic resources (listed in Figure 21). Given that 18 participants identified tutorials and workshops as their preferred instruction method, but only 5 had used these methods in the past, greater publicity for these instruction methods might be warranted.
However, as one student who had been given instruction commented: “... you’re really talking about two things. Learning about the resources is one thing, but learning to use the resources is totally separate ... [using the resources] really does take formal training and we never got any.” The relationship between in person instruction and ability self-scores suggests that these instruction methods may need some restructuring.

**Library News and Updates**

Receiving e-mails was by far the most popular method of receiving news and updates from the library: almost six times more common than the next most frequent response. Other responses, from highest frequency to lowest, were:

- Newsfeed or blog on the library homepage, or a link to it on the homepage (4 participants);
- Directly from professors (3);
- Blackboard announcement (3);
- Handouts or flyers (2);
- Announcement on UNT homepage (1);
- Pop-up announcements on the library computers (1);
- Mass text messages to students (1).

**The General Research Process**

**Observed Behavior**

Three broad types of research behavior were observed while participants were conducting online research, and each behavior is best employed to achieve a certain research objective.
### Behavior

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Best Applied to Achieve</th>
</tr>
</thead>
<tbody>
<tr>
<td>As narrow a search as possible on a specific resource</td>
<td>Search for one particular article or book</td>
</tr>
<tr>
<td>Broader search on a specific subject, often across multiple resources or many issues of one resource (i.e. journal)</td>
<td>Search for supporting subject matter for a specific topic or in developing a paper topic in a particular research area</td>
</tr>
<tr>
<td>Listing and browsing resources (such as all articles contained with one journal)</td>
<td>Browsing for articles of interest</td>
</tr>
</tbody>
</table>

In some cases, broad searching on a specific subject is performed using one resource (such as Google), and the results are noted. Then a second, narrow search is performed to locate the resource using the UNT Library, which provides access to the full text of the article.

Participants used a wide variety of strategies to achieve their research goals. Their activities required knowledge of:

- Available resources and which resources most likely contained the sought-after results;
- Search terms and filtering methods (appropriate to the resource being used) that bring back the most relevant results;
- Efficient ways to manage gathered materials for future reference.

Participant’s level of knowledge in each of those areas varied. Participants were observed entering:

- Too many words in the search boxes, yielding no results;
- Irrelevant or incorrect words in the search box, such as “journal articles on West End Dallas;”
- Overly broad searches, such as “Iran,” producing thousands of results.

When the wrong strategy was employed to achieve the stated research objective, participants showed frustration. Difficulty in putting together successful keyword searches was also present in the interview data:

“I don’t know why sometimes the words are not processed in a way I would like to... Like I need to find out combinations of words to look for specific articles and, um... if I don’t have the author's name, I try different combinations...”

“Sometimes I get frustrated with the UNT website, because if I don’t type in just the right keywords, I mean you can really go amiss and you miss it and then you have to... I go into Google Scholar and then bring up something about the articles and I can... and I find out who wrote the article, then I can go back to UNT and type in the author's name.”

### Multiple Strategies

Participants used a variety of methods for collecting research, and many expressed preferring one or two journal databases in particular. Some participants said they preferred using their favorite database, even if it meant logging into another school's library in order to use it.
Most mentioned UNT Electronic Resources as a part of their research process:

“Well I first log in to the UNT Library homepage and then I look for the online catalog. And sometimes I find better results with that catalog than the actual research or articles and journals... I look for the catalogs and basically I use always the same one. Like art education journals and... through JSTOR and ERIC. That’s basically what I do and sometimes I look for other subjects but I’m not quite sure how to categorize them so I don’t know enough of those. For example, I know I would find journals that are related to education in psychology journals, but I don’t know them, so I just keep looking for the same sources.”

“I would say I only use the online resources from UNT library, and um, other Web sites that are referred from professors or other students in the program.”

“I go to the library home page, click on the electronic resources, and then pick a couple of databases that I really like EBSCO because you can choose from a lot of different sources. Like you can go from ERIC or Education Research Complete and you can do a search from all of those databases at once. So I really like EBSCO. I use RefWorks quite frequently and the digital dissertations that they subscribe to that UNT subscribes to as well. It’s been really helpful.”

Many mentioned Google as a part of their research process:

“If I don’t know where to go, I usually go on Google first.”

“Well I Google everything. It’s the best way to get the most relevant information.”

“I use Google sometimes, if, like, I can’t find enough at the UNT Library online, I usually just go to Google and look through Scholar to find any articles relating to my subject, preferably the free ones.”

The following table shows how participants talked about the three different broad types of online research resources in interviews, broken down by class level.

<table>
<thead>
<tr>
<th>Level</th>
<th>Mentions UNT Electronic Resources</th>
<th>Mentions Google Scholar or other scholarly site</th>
<th>Mentions general search engine or other site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate LOWER (5 interviews)</td>
<td>80%</td>
<td>-</td>
<td>60%</td>
</tr>
<tr>
<td>Undergraduate UPPER (13 interviews)</td>
<td>77%</td>
<td>23%</td>
<td>62%</td>
</tr>
<tr>
<td>Graduate (10 interviews)</td>
<td>100%</td>
<td>40%</td>
<td>40%</td>
</tr>
</tbody>
</table>
All participants who only mentioned general search engines (like Google and Yahoo) as research resources had received no library training. However, some participants that had received little to no library training did mention specific UNT electronic resources as primary research resources, indicating that they had some success in navigating the UNT electronic resources on their own.

**Google's Single Search Box**
Participants enjoy Google's style of entering the search phrase in one initial search field, then viewing the entire list of results from a single search. The UNT website requires multiple searches to access the multiple databases.

“There's nothing you can't find on Google.”

“Google is simple. It's user-friendly.”

This “single search box” concept also showed up in the interviews. For example, this participant talks about a comprehensive search field she used on the UNT Library website:

“I think at one point there was this link that you could do a search through this one link and it would connect all the databases. I'm not sure if that's still there. It used to be a real hot bolded link because it was new. I'm not sure if that’s still available or if it just got hidden with all the other links.”

**Strengths**

Overall, students had many positive things to say about the UNT electronic resources. While all participants offered positive feedback in some form, responses tended to be most varied and specific among older participants (above the age of 26), graduate students, and participants who expressed a greater level of comfort or skill when using the resources.

Participants feel that the UNT electronic resources are comprehensive. They appreciate the wide range of databases and publications available to them, and many expressed a belief that there is no scholarly information that cannot be found within the databases. Also, participants consider the ability to search multiple journals simultaneously a valuable asset.

The UNT electronic resources are also known for their credibility. Participants across all categories recognize that information garnered from the UNT electronic resources is reliable, credible, and from a scholarly source. In the age of Wikipedia and Google searches, this credibility is highly regarded by students. Many claim that professors expect, and in some cases require, students to use the UNT library website for this reason.

Participants recognize convenience as a strength of the UNT electronic resources. They appreciate that the resources are available to them anytime, anywhere. This is especially true of distance learners, but on-campus students mentioned this strength as well. The flexibility online research offers allows students to juggle other obligations and complete their schoolwork with excellence. Many participants also indicated they were pleased to have access to databases and publications at no additional cost to them.
A few specific resources and features were mentioned by name by multiple participants. These include:
- EBSCOhost, JSTOR, and Lexus Nexus, for the broad range of articles they offer;
- RefWorks, because it helps students stay organized;
- Search functions, such as the Article Finder and check boxes for narrowing a search to peer reviews/scholarly articles only;
- Formatted citations in search results for use in bibliographies;
- Organization of search results by date; and
- Interlibrary Loan services, particularly for distance learners.

Barriers

Overall, the barriers participants experience when using the UNT electronic resources can be grouped into a few broad categories. Although it might appear, at first glance, that some barriers contradict or negate the strengths mentioned above, the analysis may actually reveal areas of user error or lack of knowledge, which can help identify needs for training, the dissemination of information, or clarity of design.

The first broad category of issues with the UNT electronic resources is familiarity. Participants describe a fairly steep learning curve as they learn to navigate the resources initially. Some found the database options confusing – particularly those who do not use the site often. During our observations a few participants tried to execute keyword searches in the Abstracts & Indexes search box. Some participants complain that there is no search function that spans all databases and resources. Others who expressed frustration admitted that they were not familiar with the services librarians offer to students who need help, and did not know they could call a librarian for help. A few participants claim there are inadequate resources available in their subject area (specifically, these were Biology and Communications undergraduate students).

The second category of barriers identified in our study is issues of design. Participants describe the UNT electronic resources as cumbersome, clunky, complicated, cluttered, and not user-friendly, intuitive, or streamlined. Many participants find the layout of the website confusing, and some have difficulty finding and using the UNT electronic resources. Some participants had to use Google to locate the UNT library homepage. According to some, the link to the Abstracts & Indexes page is small and not centrally located, and they find the large number of menu options on the homepage confusing. Some feel daunted by the number of times they are required to enter login information. Overall, participants wish they could retrieve the information they need with “less clicks.”

The content of the UNT electronic resources constitutes the next category of barriers. A large number of participants acknowledged that they have had at least one experience where they could not find enough information on a topic they were researching. Although many believe that there is no scholarly information the UNT electronic resources do not have, participants do not always feel they are able to find what they need. Many feel that searching the resources is an exercise in trial and error, which takes too much time and does not yield satisfactory results. Some participants admitted to performing broad-based searches on other sites, such as Google Scholar, and then returning to the UNT electronic resources to retrieve the publications they
want. Participants feel their keyword searches are often ineffective, producing results that are irrelevant to their topic. Some are confused by the more advanced search options (particularly the less skilled users), while others would like to see more advanced criteria come available (such as searches by date or type of publication). Many participants complain that at times journal articles are not available in full-text format, causing them to omit resources from their research that might otherwise be helpful. Additionally, in regard to journal articles, participants claim that abstracts are not available for all articles, making it hard to determine whether an article will be relevant or not.

The last broad category of barriers identified by participants is technical issues. This category encompasses issues of connectivity and compatibility. Some participants expressed frustration at being “kicked off” the UNT website occasionally and having to log in again before they can continue. Some participants claim this problem has occurred less frequently in the last few months. Mac (or Apple) users claim they experience compatibility issues at times, particularly with the Safari browser.

Other Websites

Participants shared information about the other websites they use to complete their academic research. These are the websites mentioned, along with the reasons participants gave for their choice:

1. Google, the overwhelming favorite, because it is familiar, simple, and offers a broad-based keyword search;
2. Google Scholar, because it offers all the perceived advantages of Google while yielding results that are scholarly;
3. Wikipedia and Yahoo, for similar reasons as Google;
4. Other schools’ websites (MIT, DBY, NSU…), because participants are familiar with a site, attended that school, or know of resources that are particularly useful in their field; and
5. Amazon, to find bibliographic information.

Overcoming Roadblocks to the Research Process

Students were observed or asked about what they did when encountering roadblocks and barriers in their research process.

Disregarding Unavailable Sources
While many graduate students demonstrated a strong desire to access sources even if they were unavailable in full text, over 50 percent of undergraduate students said they were likely to disregard a source if they were unable to access the source within the UNT library online databases.
Many undergraduate students also said they had or were likely to change their overall research topic if they were unable to access information through the UNT library.

**Asking for Help**
In general, most students, approximately 60%, said they had or were likely to ask for help. Some students said they would contact the library itself, either in person, online or by phone, while others said they would ask their classmates and friends.

**Technical Problems**
When facing technical problems within the UNT website, many students said they log out, and either start their research process over again, or come back later.

**Ideal Ways of Receiving Help**
Students definitely have strong opinions about how they ideally would like to receive help with their questions for the library. Time and time again, we encountered themes of rapid response time and personalized service as we conducted our research.

**Instant Gratification**
In the world of online research and 24 hour call centers, students have come to expect immediacy in response time. This fact was clearly shown by the overwhelmingly positive response to services currently offered such as “ask a librarian” and instant chat. Extending hours or making a 24 hour service available was seen as ideal, especially to online students who typically study during non-traditional hours.

**Talking to a Human Being**
The other theme that emerged here was the request for personalized service. Students preferred face to face interactions or at least conversing electronically with a live person rather than a search engine. Possibly sharing a desktop with a librarian electronically or having a video chat would increase this level of personal interaction. Additionally, it was also mentioned that having access to librarians who specialize in certain areas was ideal.

**Librarians**
As part of our research, we wanted to know how often the students reported working with the librarians and how those experiences were interpreted. The overwhelming response was *extremely positive*.

Approximately 80% of our research population reported working with a librarian on at least one occasion. Several of the respondents knew the specific librarian by name and could remember the details of the interaction. On all occasions, the students found the librarians knowledgeable and helpful. While most of these interactions were through phone or email, we can assume any increase in personal contact with librarians will produce a positive result.
Specifically, library tours and occasions when a librarian would come speak in class were seen as extremely helpful. Increasing this activity would be very beneficial.

Managing Research

Participants in this project noted several different ways that they typically saved and organized their research from the UNT website. Several used their hard drive or a USB flash-drive to save their information, while others would cut and paste relevant information and quotations into a document to organize it. Some saved sources using webpage bookmarks and many used the email links offered by the article databases in order to email the article or resource to themselves. Five students specifically referred to using programs like RefWorks, Ubernote and Endnote to organize and compile their research. Compiling and consolidating information was done almost exclusively electronically, while physical copies were only printed out after the information was collected and reviewed.

Problems with Managing Information while Conducting Research

Most participants reported no problems with the features or programs they use to manage research, with the exception of a few reoccurring issues. Participants reported having trouble downloading references at certain points and also mentioned compatibility issues with newer versions of Microsoft Word. When downloading articles or sources, they noted that some files would save in unknown locations or were difficult to find due to vague file names. Several RefWorks users encountered problems with saving articles (creating duplicates) and had log-in issues, specifically with off-campus students.

Dealing with Interruptions

Among all participants, there were two general answers: Participants would restart their search process through the UNT library website or they would continue on from where they were before the interruption. Some of the participants did not recognize interruptions in their research efforts as a problem and therefore had no formal process to continue after the interruption.

Library Homepage

Functions
The three main issues surrounding the libraries homepage dealt with the practical functions of the site, the aesthetic appeal, and access to the homepage. The size of the text was too small and hard to read for many. They asked to have both text and icons made bigger and more interactive with examples such as an ‘Ask the Librarian’ bell that actually rings or a hand tool that can be used to combine selections. A large portion of participants said that there was too much information on the homepage (see figure 22), which made it difficult to understand in terms of further navigation. One resolution would be a simplified homepage with less clutter and only the features used most often by students. One participant remarked, “a library site should know its
top three or four things that people want, usually. Why people go there. It should make the site have gigantic buttons, right in the middle”. Two participants specifically asked for a 3D virtual library on the homepage with different rooms to go to, avatars (characters) to answer questions, and a literal helpdesk.

Figure 22: Library Homepage

Aesthetics
The visual appeal of the library website was another issue for at least eight participants, who commented on aspects of color, graphics, and other visuals. One participant explained, “I think people remember things better when there’s a visual there.” They mentioned changing the colors and using more imagery would make the site more pleasing and user-friendly. One mentioned neutral and complementary colors are more pleasing while two simply mentioned that the current color scheme was displeasing. Several said they needed imagery to make the site more approachable and to help guide searches. Suggestions included having book covers shown along with the books information and images to help explain catalogues.

Access
There was a wide array of ways that participants accessed the UNT library homepage, including Google, bookmarks, and the UNT homepage. Participants repeatedly reported frustration with using the UNT homepage to access the library page. The majority of participants accessed it this way and several said that the links were hard to find and the process took too long. One participant commented, “I will say this, that going from the main UNT page, and click on libraries, it doesn’t take you to the library page, it takes you to this other page where amongst many other things on there, are library and other types of informational resources. You have to hunt around for another small link that says ‘library search page’ or something”.

Problems with Search Format
Two major concerns in terms of format were the “Electronic Resources” webpage and configuration aspects of the library website in general. Many participants were confused or frustrated by the “Electronic Resources” webpage in terms of how to navigate further. Many do not know what journal database to use and end up using the ones that they’re most familiar with, not the one that may be most appropriate for their search. Several would type in their article or subject area and would get stuck. One participant said that “I spend more time navigating than doing actual research” as a result of searching through databases. The last major aspect of searches that frustrated participants was the amount of pop-up problems, off-campus compatibility, and log-in frequency issues that occurred. Participants complained about limited access due to pop-up blocker features when researching on off-campus computers. Other access problems were reported by two participants when it came to off-campus compatibility. Several participants simply commented on the frustration of having to log-in multiple times during searches.

Successful Search

Participants commented on several aspects of the search process and results that constituted what they would consider a successful search on the web. Several considered the amount of sources and articles they found to be determinate while others strived for finding the best sources in a timely fashion. Others considered their search successful if they used a variety of databases to find their results. Almost all participants mentioned the requirement of the sources being credible or peer-reviewed when discussing what a successful search meant to them.

Suggestion for Search Format

At least six participants suggested having links to specific colleges within the library website to help narrow down searches into appropriate databases and journals. Some mentioned doing this to designate which databases work best for their classes, while others suggested having each class available within the college, so that professors could designate the sites, databases, or journals to use. This would be done as an alternative to going to the “Electronic Resources” webpage and picking from the myriad of options presented there. Many participants also mentioned wanting a format for article searches similar to Google Scholar. They liked how, not only could you find your article, but the search engine would give you related articles, including ones that had been cited, or were citing the originally searched source. A few participants also suggested that the library establishes an interface with Google Scholar (similar to the University of North Dakota) and even with other universities’ electronic resources.

Recommendations

In the previous section we discussed many suggestions that library users have given for improving their experience using the UNT Libraries website. In this section, we provide a more tailored list of recommendations in consideration of the entire research project.

- Improve user experience with the UNT Libraries website. We recommend working with the design department to make the website more visually attractive, to simplify the
website design, to create an integrated search tool (much like Google Scholar), and to create the possibility for students to personalize the library website for their needs.

- **Improve library instruction.** We recommend further collaborations between the library and professors and tiered levels of training. Google is making people overconfident because it is forgiving of poor search terms. For this reason we recommend offering basic tutorials and more advanced tutorials (such as how to perform a successful search, and tutorials for new research projects). Tutorials should be quick and interesting video tutorials.

- **Improve communication.** Even though many resources for instruction are available to students on the UNT Libraries website, students do not know about them. We recommend creating a printout catalog of the site that would include explanations of different databases and what those databases can be used for. We also recommend more publicizing of the library URL and the tutorials.
References