Researching Resources: A Usability Study of Appalachian State's Library Website and the

RC 1000 Research Guide

by

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# **Table of Contents**

I.	Abstract Introduction				
II.					
III.	Background				
	a. Technical and Professional Communication				
	b. Usability Testing				
	1. Design Thinking	10			
	2. UX and Accessibility	11			
	c. Libraries, LibGuides, and UX	14			
	1. UX and Library Interfaces	14			
	2. Belk Library and Information Commons' Website	17			
	3. LibGuides	21			
	4. The Layout of the RC 1000 Research Guide	23			
IV.	Methods	26			
	a. Pre-Test	27			
	1. Participant Recruitment	27			
	2. Pre-Test Survey	30			
	3. Participant Demographics	34			
	4. Pre-Test Script	35			
	b. Usability Test	36			
	1. Sessions	36			
	2. Section I and II Task Design	37			
	c. Post-Test	40			
	1. Post-Session Interview Structure	40			
	2. Post-Session Interview Questions	42			
	3. Post-Test Survey I and II	43			
V.	Methodology	44			
	a. Testing Type and Moderation Technique	44			
VI	Test Results	46			
	a. Task Completion Rates	46			
	b. Test Observations	48			
	c. Time on Tasks	53			
	d. Post-Session Interview	55			
	e. Post-Test Survey Section I: Homepage Tasks	57			
	f. Post-Test Survey Section II: LibGuide Tasks	59			
VII.	Discussion	62			
	a. Unclear Link Titles	63			
	b Layout and Organization	66			
	c Additional Issues with Features	68			
		00			

	d. Lack of Convenience		
	e. Interview with Mark Coltrain, RC 1000 LibGuide Author	72	
VIII.	Limitations		
IX.	Recommendations	78	
	a. Critical	78	
	b. Moderate	82	
	c. Minor	86	
X.	Conclusion	88	
XI.	Appendix A	90	
XII.	Appendix B	96	
XIII.	Appendix C	127	
XIV.	References	128	

### Abstract

Detailed in this report is the methodology, execution, and discussion of a usability study of Appalachian State University's library website and the RC 1000 Research Guide. The main objective of this study was to observe how real users interact with the current online library interface, identify any issues of usability and accessibility with both the library homepage and the RC 1000 Research Guide, and use the data collected to propose applicable solutions to improve the overall user experience for students at Appalachian State.

Both quantitative and qualitative data were collected using a moderated testing method, a series of pre- and post-test surveys, and individual interviews with each of the participants. The results of this study indicated that students tend to have little trouble with general website navigation; however, they hold convenience in high regard, often choosing to use more familiar and straightforward search engines for research over the many online resources provided to them through the library website. Recommendations centered around making the homepage and the RC 1000 Research Guide more convenient for student use and are included at the end of this report. These small changes can impact the user experience positively by reducing the amount of time necessary to wade through the many pages included on this site and providing easily accessible information on how to use the many freely available online resources for research.

## Introduction

In a world that has become increasingly reliant on technology for work, entertainment, education, and more, libraries have had to undergo a technological evolution to keep up with the needs and demands of their user base (McClain et al., 2022). In university libraries, this evolution is just as important. With university curricula depending on online interfaces and e-textbooks and with the increasing number of students learning from a distance both by choice and because of the advent of a global pandemic, it is only natural that the libraries at these organizations must work to constantly improve and update their online presence. Regular updates help these interfaces continue to serve the needs of the students, faculty, and staff that depend on them to maintain the academic standards expected of a higher educational institution (Bouchey et al., 2021).

At Appalachian State University, one of the essential online resources for both distance-learning and in-person students is the website for Belk Library and Information Commons. This site contains many academic resources that students may access at no additional cost that can be used during the course of their tenure at this institution, all in a format that makes them accessible both on and off campus. Both the increase in the demand for resources to complete online research as well as the rise of distance-learning students have caused a foundational shift in how online library interfaces must operate (King & Jannik, 2005). Because of this increased reliance on the library website for typical classroom functioning, an emphasis must now be placed upon the usability and ease of access for the end-users, the students, in the design, instructional material, and written communication of many of the library's web pages. One way in which this shift towards increased accessibility of online resources may be accomplished is through the use of usability testing.

This thesis project investigates how real-world users, first- and second-year students enrolled in the first year writing course, Rhetoric and Composition (RC) 1000, interact with the resources available to them through Appalachian State's University Libraries website. In this study, participants are observed completing realistic tasks using both the library website's homepage and the RC 1000 Research Guide. Using a moderated testing strategy, participant behaviors as well as qualitative and quantitative data was recorded, including task completion rates and time metrics. The data collected through these methods was examined and discussed, and recommendations were made based upon this analysis. The objective of both this study and these recommendations is to identify applicable solutions to issues discovered during the test so that changes may be made that allow the usability and accessibility of this library interface to increase in order to better serve the needs of the student population.

## Background

#### **Technical and Professional Communication**

Since its conception, technical and professional communication has been difficult to define. Though many may assume that this type of communication is relegated to the small pool of technical writers employed within the field, Miles Kimball, in his article on the "Golden Age" of technical communication, disputes this, instead claiming that "technical communication is not just a profession, but an activity that manages technological action through communication technologies, including writing itself, in a particular setting and for a particular purpose" (2016). Kimball writes, "not all human communication is technical communication is a large and growing part of human communication. We are all technical communicators" (2016). The seemingly ubiquitous

nature of technical communication makes its scholarship and many of its concepts applicable to a broader section of industry communicators. The Society for Technical Communication states a very similar idea, emphasizing the broadness of the field and including a list of characteristics that any form of communication must exhibit one or more of in order to be considered technical. These characteristics include communication that discusses a technical or specialized topic, communication which utilizes technology like web pages or forums, and communication which provides instruction on how something is done ("Defining Technical...," n.d.). Through these much more general understandings of what technical and professional communication (TPC) is, one is better able to understand how this discipline can be applied in the field of usability and user experience based design. The application of these concepts can vary broadly depending upon the perspective of the practitioner. One such perspective from scholarship within the field of TPC is the social justice turn, an approach to the field which focuses on advocacy for the user.

When approaching design through the lens of this social justice perspective, the user must be at the center of the design process. However, when a design fails to address the needs of all users, instead concentrating only on productivity or the needs of only one group, the actual level of usability of the design must be called into question. In the pursuit of efficiency and expediency, the focus on the human experience has often been set aside (Jones, 2016). Natasha Jones, in her article on the integration of a social-justice approach in technical communication, asserts that there is a need in the field of TPC to place a greater emphasis on using technical rhetoric as a means to promote social change. She maintains that the issues of social justice coincide heavily with that of TPC, acknowledging that technical communication, broadly defined, is not neutral or objective in nature, no matter how matter of factly it is presented (Jones, 2016). She states, "to be humanistic is to...understand that technical communication is not neutral or objective," and that the field of TPC needs to emphasize the social justice perspective to implement practices which look "beyond the technology and toward the social contexts and processes . . . that positively impact the mediated experiences of individuals" (Jones, 2016). The social justice perspective acknowledges that technical development does not happen in a vacuum. Technology and technical communication are not utterly separate or devoid of the influence of human culture (Jones, 2016). They are developed by humans and for humans, but if the need for efficiency is placed totally above the need to cater towards the user, the humanity of this process is lost. UX testing is a way in which designers and communicators can implement the social justice perspective within their respective fields. Through its humanistic, user-centric approach to design, UX testing can promote the empowerment and legitimization of the voices and experiences of underserved and underprivileged user groups (Acharya, 2018). As the Interaction Design Foundation put it, "when you design for all ability levels, you can create products and services anyone can use and enjoy" ("Accessibility," n.d.). By advocating for social change and accessibility in the world of technology and communication, practitioners of these disciplines are creating a better user experience.

#### **Usability Testing**

Usability is an assessment of a user's ability to operate a product or design in order to accomplish a set of tasks or specific goals both effectively and thoroughly ("Usability," n.d.). Usability testing is a user experience, or UX, research method that is utilized in many different fields and industries to evaluate problems within initial designs, identify opportunities for improvement, and learn about the behaviors and attitudes of the target endusers (Moran, 2019). Results from usability testing allow product and web designers to focus on end-user development, and incorporate design thinking in a human-centered, innovative, and prototype-driven approach ("Usability Testing," n.d.). With this method, users are brought back to the forefront of how systems, products, and technologies are created. Because the usability of a design depends upon how successfully it accommodates its users' needs and contexts, the designer must take on the responsibility of creating a design that aligns with these goals ("Usability," n.d.). Elements of usability include effectiveness, efficiency, error tolerance, engagement, and ease of learning, which all combine to allow users the ability to easily navigate a design and achieve their objective without the need for assistance from an outside source ("Usability," n.d.).

In most usability tests, the researcher, sometimes referred to as the facilitator or moderator of the testing session, gives the user a series of tasks to perform to the best of their ability. During each task, the researcher observes the behavior of the user, noting how they complete or attempt to complete the task, and listens for feedback (Moran, 2019.). One of the main objectives of usability testing is to find a design flaw that may have otherwise been ignored (Interaction Design Foundation, n.d.). While designers may be experts on how a product should work, a user has the ability to demonstrate how a product actually works (Kimball, 2016). Even designers well-versed in user-experience are not guaranteed to create a flawless design without several iterations influenced by real user interaction (Moran, 2019). Without usability testing, the lack of flow, visual clarity, and consistency in non-iterative designs can negatively impact the design's usability, significantly downgrading the user's overall experience. When discussing the value of TPC, the Society for Technical Communication suggests that technical communicators work to make information accessible and usable ("Defining Technical...," n.d.). Much like in technical communication, the goal of usability testing is to create a better experience for the target audience. Usability testing within the world of technical and professional communication and product development inspires more human-centered designs, the sort of design that focuses on the needs and wants of the end-user ("Usability," n.d.). This has especially become true as design thinking has gained popularity in fields outside of a traditional design context, rapidly permeating the world of TPC and changing how these communicators go about the process of design.

#### Design Thinking

Design thinking, or the iterative process by which a designer works to understand the user perspective and create innovative solutions through this understanding, is a pervasive idea in both TPC as well as user-experience testing, drawing even more connections between the two already interrelated fields. This process involves several phases which correlate heavily with those of usability testing: empathizing with the target users, defining the problem at hand, ideating solutions to said problem, creating a prototype of said solution, and testing the prototype (Dam & Siang, 2022). In technical communication, there are several perspectives with which one can approach the design thinking process: the process perspective, the industry and program perspective, the technical perspective, and the usability-user experience perspective, all of which expand the conversation around the role of design thinking within the field of TPC. Within the usability-user experience perspective, experts note that the focus should remain on user advocacy, especially when teaching students about how to be better technical communicators. According to scholar Theron Howard, "that's where we heal the divide between design thinking and usability-both working to help our students to become user advocates, human-centered problem solvers"

(Pope-Ruark et al., 2019). Design thinking helps to emphasize the role of empathy within user-experience, promoting advocacy over efficiency.

Empathy is an important tool utilized by TPC professionals who focus on design thinking in order to advocate for the needs of their users. Applied empathy in the technical writing profession is the ability to sense and understand the perspective of others, utilizing empirical processes to collect and analyze "actional data" (Davis, 2019). In order to begin the process of iterative, user-focused design, one must empathize with the target audience. Empathy fosters humility and motivates collaboration, providing a less subjective perspective from which communicators and designers can view their own work (Davis, 2019). By advocating for the needs of the user in this way, technical communication professionals are utilizing this concept of applied empathy within their design thinking to implement the process of iterative design and promote a more user-experience based approach. Advocacy within TPC is an essential part of creating a better user experience. Technical communication is not created within a vacuum. It is created by people for people, and thus should reflect the communicator's intention to advocate for the needs of the user. UX testing is an important tool for user advocacy in the arsenal of the TPC professional, and when applied within this field, can provide a way to promote accessibility and usability in a human-centric capacity.

#### UX and Accessibility

One of the main objectives of usability testing is to create a more accessible experience. In fact, according to the Interaction Design Foundation, great user experience means a combination of usability, graphic design, and accessibility ("Accessibility," n.d). As a technical and professional communicator, addressing accessibility, or the quality of being easy to obtain, reach, understand, or use, is a task that must be completed with all people in mind. But what does it mean for a UX test to promote accessibility? First, it is important to note that 26 percent, or one in four, of the population of the United States lives with some disability, including but not limited to disabilities affecting mobility and cognition (Centers for Disease Control and Prevention, 2022). So, when addressing the topic of accessibility, it is imperative that the rights, needs, and wants of those within these communities are being advocated for. If a design, web interface, or product is created in a way that does not afford all people, regardless of their physical, mental, or economic status, the same opportunity to obtain information, utilize the same services, and have access to the same interactions, then it cannot qualify as being accessible ("Accessibility," n.d.).

With so many designs being created exclusively with able-bodied, socially privileged members of the population in mind, it is essential that TPC professionals and all others seeking to improve accessibility make use of UX testing. UX testing offers a comprehensive look at how real users may interact with a certain design or product. These studies can show designers not only how real people interact with their products, but why they interact in that way. The background, physical boundaries, and cognitive capabilities of a user all have an impact on how they interact with different designs ("Accessibility," n.d.). UX testing is a way in which designers can take these considerations into account and implement changes to better support their user base.

One way in which UX testing allows products and designs to serve the needs of their users is by helping to determine how best to convey information. How information is presented to an audience matters. By presenting designs, products, and information in a format that is inaccessible to certain users, designers are dictating who is and is not worthy of using these resources. It is in these instances that the marginalization and othering of users with differing abilities occurs. The implicit bias within inaccessible design makes this marginalized group of users seem somehow less deserving of having the best user experience possible. In this way, one can see the relationship between rhetoric, design, and power. A design is inherently rhetorical in nature, and the rhetoric behind it can often hold a certain power over the users and public opinion, whether or not it is deliberate and intentional, depending on who the design was created for and why. Hass and Eble describe this notion in their paper on the "social justice turn" in TPC. They argue that the creation of technologies is informed by cultures and ideologies. They state that "technologies and sciences are unequally prescribed, controlled, and delegated. They have been used to empower and oppress" (Haas & Eble, 2018). Great user experience involves both usability and accessibility. Due to the similarity between these two aspects of good design, there is often a tendency to equate them as being the same thing. This is not the case. While usability is concerned with whether designs are effective and efficient, theoretically making the design accessible, practically, the usability of a design tends to be centered around the able-bodied, neurotypical user. This is where accessibility differs from usability. Accessibility concerns itself with the ability of all users to have an equal user experience ("Accessibility," n.d.).

Some of the ways in which accessibility standards can be applied in practice are outlined by the World Wide Web Consortium, or the W3C. These standards include using a content management system which supports established accessibility standards, including header tags within copy, using alternate text or content-enhancing images, improving the visibility of a design through deliberate color and contrast choices, referencing the various shapes of content, offering transcripts of audio and video elements, and using specific tools like WAVE to test the overall accessibility of the design ("Accessibility, Usability...," n.d.). Through the observation of users with diverse abilities within a UX test setting and the application of accommodating practices such as those listed above within design, designers as well as technical communicators can apply a social justice approach to their work and promote accessibility and inclusivity in a broader context. To view more information on promoting accessibility through UX testing in higher education, see appendix c, item c1.

#### Libraries, LibGuides, and UX

#### UX and Library Interfaces

As the world has become more reliant on technology as a means to obtain information about a vast array of topics, libraries, an essential community resource for information gathering, have also shifted their efforts towards maintaining an online interface for their patrons. A library's website provides their patrons with access to critical library resources, supporting the use of instructional and research activities, providing services to students and faculty members within a university setting, instructing the public on guidelines for information retrieval, and serving as a communication tool for community outreach (Eaton & Arguelles, 2019). According to Heather King and Catherine Jannik in their study on the usability of the Georgia Tech library website, the increase in distance learning and the rise in user-demand for online research resources has led to a fundamental shift in how these websites must operate. As they put it, "in many ways, the library's website is the library" (2005). This idea rings especially true within the world of higher education.

Academic libraries are a foundational aspect of a university. They offer students and faculty members the opportunity to use resources freely that may not be available to them otherwise. However, as technology has become more essential to general university functioning, not to mention the advent of a global pandemic in 2020 quickly pushing the

world, universities included, towards building an online presence, creating, updating, and maintaining a "digital branch" has become more and more important (Eaton & Arguelles, 2019). In a world such as this one, it is critical that library websites remain accessible to patrons. Universities have begun to rely more heavily on the use of online instructional materials, e-textbooks, video calls, and online library interfaces to maintain the standard of education that is expected of a higher educational institution (Bouchey et al., 2021).

While library websites are certainly important to the function of the university, unfortunately, due to the ever-changing nature of technology, websites tend not to age well (Eaton & Arguelles, 2019). Poor layout design choices, unclear navigation, and low contrast colors can make using an online library interface incredibly difficult to navigate, obstructing students from gaining access to the necessary resources for their academic pursuits. In-person as well as distance-learning students deserve the ability to easily access the educational resources that are provided to them through their respective institutions.

Based on the growing reliance upon technology for instruction and the various technological devices students are required to have for courses, many universities seem to harbor the assumption that all students are inherently well-versed in the ways of modern technology. This assumption ignores the existence of non-traditional students, students with disabilities, and students with little previous access to the latest technology due to economic and/or geographic constraints. Substandard or antiquated web page design, language that is difficult to understand, and convoluted navigation pathways combine to create an incredibly negative user experience for these students. These sites were made to be used. They are there to make information accessible to their users. If their overall usability to the student population is not up to par, then they are no longer useful resources. One way that

universities can and have gone about attempting to mitigate this issue is through the use of UX testing.

The necessity of frequent and comprehensive reevaluations of library web interfaces in light of the fast-paced life span of technology calls for an update cycle that is executed with the needs of the user base in mind. Many institutions have made the decision to utilize usability testing in the hopes of bettering the user experience of their students. Schools from around the country such Duke University, NC State, and Georgia Tech have all worked towards creating a more accessible library web interface system. Kingsborough Community College in Brooklyn, New York is one of the many other schools that have implemented UX testing in an attempt to help their students succeed (Eaton & Arguelles, 2019).

With a large student population of immigrants and first-generation college students, Kingsborough is intent on creating an environment that fosters inclusion, equality, diversity, and the principles of social justice (Eaton & Arguelles, 2019). In 2019, they began a "web migration" project that would reorganize the resources offered on their library's website. Their main goal was to increase the usability of the interface. To them, this is an especially important goal as many of their students access the library resources remotely. Because of this, they used UX testing that focused on observing users complete user-centric, realistic tasks in order to attain "practical and actionable conclusions" (Eaton & Arguelles, 2019). According to this study, the data that was collected provides in-depth and comprehensive insights that now serve to better inform website-design decisions, greatly improving at least one aspect of their website refresh cycle (Eaton & Arguelles, 2019). This study as well as many others indicates that the use of UX testing within the design process and reevaluation of library web interfaces can have a significant impact on student interaction with these sites.

In the context of TPC, it is easy to point out that library websites and user interfaces in general are not "neutral artifacts." They are more accessible to some (those with access to technology and education as well as those whose physical and cognitive capabilities do not hinder their ability to use such sources) than others (those without access to technology, education, and libraries as well as those with disabilities). Taking this into account, it is important to maintain the perspective that a human-centric, user-focused design approach is essential to creating the best possible user interface. Regularly updating sites and integrating new technologies into user interfaces is a way in which library websites can continue to serve an ever-evolving world and user-base. However, knowing exactly what needs to be implemented to create a better user experience can be a difficult task. This is where UX testing comes in. This kind of study is an effective way for designers to gain insight into the perspectives and habits of users in order to better understand potential issues with userdesign interactions and come up with applicable solutions to these problems. These kinds of solutions are incredibly important in the context of libraries because of the significance of these websites as educational tools in an increasingly technology-dependent world.

#### Belk Library and Information Commons' Website

Belk Library and Information Commons' website, found at library.appstate.edu, is an online user interface that provides students and other library users access to the library's many resources and digital content. Some of the resources found on this website include several academic databases, instructional materials, the online library catalog for both digital and physical materials, and access to book study rooms and research advisory services with university librarians. With this interface, library patrons have the ability to accomplish typical library related tasks such as research without the need to be physically present in the library space. This advantage became even more relevant during the COVID-19 pandemic in which students and other community members had little or no access to the library itself.

In order to continue to accomplish these goals, Belk Library's website and others like it must apply design choices that center around the needs of their users. Librarians with Syracuse University in collaboration with the iSchool Public Libraries Initiative conducted research using library statistics with the hopes of implementing certain guidelines and best practices for the betterment of all types of library websites (Unrien, 2019). In this research, it was noted that the first thing that users see is how the website is designed. Sleek, modern design indicates that the website is well-maintained and up to date, signaling to the user that the information contained within is trustworthy. Conversely, more outdated features, such as old content and dead links, signify that the website is potentially out of date and poorly maintained (Unrien, 2019). These issues can be mitigated by the implementation of best practices for web design.

Minimalism and simplicity are two key principles in web design and are often the goals of library websites. Keeping clutter at bay and minimizing the amount of competing features can help accomplish this. Too much information at once can prevent proper flow and decrease website navigation. Complying with ADA guidelines and the inclusion of other unique features such as library statistics and feedback forms can bring additional credibility to an online library interface (Unrien, 2019). If it is to be assumed that most libraries share the goals of equal access and credible information services, Sabrina Unrien, in her article on library website design, asserts that "these principles of usability and design should apply to libraries of all types" (2019). This implies that academic libraries should also share these

goals and should look to guidelines and best practices such as these when designing their online user interfaces.

The leading provider of academic databases and online resources to libraries in the US, EBSCO Information Services, also has a list of the seven best practices to consider when creating a library website. The guidelines were created under the assumption that many students find library websites difficult to use, an assumption supported by a 2015 EBSCO survey which indicated that 40 percent of students found their own library websites to be moderate to very challenging to use with another 15 percent admitting to never even attempting to navigate them ("7 Best Practices...," 2015). In an attempt to rectify this issue, the implementation of the following practices is encouraged to ensure that the expectations of students are being met. The list includes defining the goal of the website, adding an easy to access search box, keeping navigation options simple, simplifying the homepage, eliminating library-specific jargon, implementing accessibility practices such as the inclusion of alt-text, and conducting usability testing to ensure that all of the aforementioned practices are being properly enacted ("7 Best Practices...," 2015). These guidelines align with many of those listed in Sabrina Unrien's article and can help to significantly improve the overall user experience of a library website.

The Belk Library website is continuously updated and maintained by staff members who work diligently to keep updated and relevant information available to their users. Several sections of the website have been included that intend to provide easier access to the many resources. The library's main webpage, which many of the tasks in this usability study center around, includes a broad range of information on some of the more popular resources on the site (Figure 1). This includes categories with titles like "Visit" which contains information on the location and hours of the actual library and "Borrowing" which details how one would go about requesting an item or checking out technology. As this is often the first page that users will see when accessing this website, it is important that they get an accurate depiction of what this site has to offer from this initial access point.

Appalachian		
Belk Library & I	nformation Commons	
Research Services Visit Give	About Contact	
Connect	Search	Today's hours: Open a
Connect	Search APPsearch (articles+) Books & Google Lib Media Scholar Web	Today's hours: Open a Find Services
Connect Chat Email Meet Find Your Librarian	APPsearch (articles+) Articles, books, & media from dozens of databases	Today's hours: Open a Find Services For Students For Faculty & Staff For Community
Connect Print Print Pri	APPsearch (articles+) Articles, books, & media from dozens of databases Advanced	Today's hours: Open a Find Services For Students For Faculty & Staff For Community search * See All Services

Figure 1. This image depicts the current layout of Belk Library's website homepage. Shown are the top navigation bar, an image of the physical library, the library's hours of operation for the day, and several sections containing links to various areas of the website.

The overall design of this site seems to fall in line with some of the principles of best practice when it comes to web page design. There is a natural visual hierarchy and flow to the layout and placement of information, buttons and links are clearly marked and clickable, imagery is relevant and high-quality, and there is consistency in colors and font choices throughout the site (Babich, 2020). The implementation of these principles make the site visually appealing and improve the overall clarity for its users. Library websites are a "critical piece of infrastructure that should seamlessly deliver users to the resources they are seeking (Eaton & Arguelles, 2019). Because of this, library websites and their designs should be a central concern for all librarians. The continued efforts of those creating this site and others like it are essential to the objective of having an online library user interface.

#### LibGuides

Libguides, also sometimes referred to as pathfinders or research guides, are content management and information sharing systems which are designed specifically for library use. These platforms allow users to easily navigate through resources and instructional materials for a specific subject, course, or assignment ("What is a LibGuide," n.d.). Platforms like these promote collaboration between librarians and instructors in order to meet the needs of particular departments and classes. Developed first in the 1970s, subject guides began as printed guides for beginning one's research in a certain discipline as well as being used as instructional tools within bibliographic instructional curriculum (Reeb & Gibbons, 2004). They have slowly developed since the early years of their conception into the online user interfaces that one sees today on both public and academic library websites.

These library guides are primarily used by library patrons and are helpful in creating standardized answers to more complex frequently asked questions (Reeb & Gibbons, 2004). The LibGuides platform allows librarians to organize relevant resources in a specific field on an easily accessible webpage, make RSS, podcast feeds, and other technologies easier for library patrons to understand and use, and regularly update the information on the web page so that users are getting the most relevant and recent information ("What is a LibGuide," n.d.). This benefits students in several different ways. Information and resources are readily available and presented in a linear fashion as to make it easier to follow, the needs of students with varying learning styles can be met with the integration of several types of information sharing technologies, both distance and on-campus students have access to library resources

24 hours a day, and students are provided with an approachable way to start the research process ("What is a LibGuide," n.d.).

Although these LibGuides are great online resources for students, several studies completed within the university setting have found that students tend to look elsewhere for information, forgoing the web subject guides and sometimes leaving their university's library website altogether. A survey completed by Duke University Libraries found that 53 percent of their patrons had never used the library's LibGuides, while 24 percent reported using them only very rarely. A usage-statistics report at the University of Rochester revealed very similar results, indicating that only five out over 40 available LibGuides recorded more than 300 hits in a school with a student population of around 7,000 during the most research-heavy month of the school year. A usage-statistics report at Wright State University only further confirmed this trend (Reeb & Gibbons, 2004).

These statistics are not to say that LibGuides are not useful or necessary. Faculty at many universities complain of students' seeming inability to properly research and cite quality materials. Some libraries have attempted to uncover the disconnect between students and these resources using usability testing. These tests have discovered that students often fail to "match their information needs with the appropriate guides" (Reeb & Gibbons, 2004). Several other usability tests completed through university libraries have indicated that students tend to use Google when tasked with more open-ended questions and that students in undergraduate programs tend to lack understanding about the concept of an academic discipline. This has made it clear that the mental model of a majority of undergraduates does not align well with library subject guides (Reeb & Gibbons, 2004). This means that techniques in the design process of LibGuides must be altered to better fit contextually with the behavior and thought patterns of students.

Some of the ways in which universities have gone about retailoring these guides to better fit the needs of their students is through utilizing practical and descriptive labeling, providing easily found access points, and contextualizing the use of LibGuides through classroom usage (Reeb & Gibbons, 2004). While LibGuides can be an incredibly useful tool for undergraduate students who are just learning proper research etiquette, it is important to recognize that students must be met where they are. If LibGuides are strategically altered to better align with how students today approach library-based research, it seems likely that students will begin to rely more on the dependable and peer-reviewed resources that they have freely available to them through their institution's library website and less so on the much less reliable search engines they often favor for their perceived efficiency and ease of use.

#### The Layout of the RC 1000 LibGuide

RC 1000 is a first year writing course which all students at Appalachian State University are required to take as one of their general education requirements. The RC 1000 course has a corresponding LibGuide with information for currently enrolled students on the basic process for completing a research project entitled "RC 1000 Research Guide." This is one of around one hundred LibGuides included on Belk Library and Information Commons' website, which are organized by course number, by the librarian that created them, by subject or discipline, and by research tools. According to the library website, these library guides are "shortcuts to finding resources owned by the Appalachian State University Library and material freely available on the Web" that have been created by librarians employed at the university. This specific guide was created by previous first-year experience librarian Mark Coltrain, who developed and led instructional outreach to first-year students through the creation and implementation of materials and instructional programs. These programs and materials aim to incorporate information literacy into the instruction of first-year students within the First Year Seminar Program, Honors College, Watauga Residential College, Rhetoric and Composition Department, and University Writing Center at Appalachian State University.

The RC 1000 LibGuide is made up of seven different tabs that offer information regarding how one might begin the process of doing a research project (Figure 2). The information included in these tabs ranges from where one can find information on the library website as well as other online sources to how to find credible information and how to cite this information within a research paper. Much of the information on this library guide comes from various links to outside sources, embedded video content on relevant topics, and downloadable PDF documents that contain instructions or additional content on completing academic research. The tabs are titled "RC 1000 Research Guide," "Choosing a Topic, Background Research, & Keywords," "Sources: Categories and Types," "Library Research Tools," Evaluating Your Sources," "Other Research Options," and "Additional RC 1000 Resources." Along with these seven headings, there are an additional fourteen subheadings under each of the broader categories that separate the information into more manageable sections.



Figure 2. The main page of the RC 1000 Research Guide, which displays the about section along with a short introduction on finding information online. The rest of the headings and subheadings are listed on the far left in the side navigation pane.

This guide follows many of the principles of design that are considered best practice for the creation of LibGuides. These principles include using side navigation, limiting the guide to ten pages or less, including updated contact information for a relevant librarian, using accessible fonts with limited italics and bolding, and embedding clear and active links ("LibGuide Design...," 2022). Within the world of web and graphic design, many rely on the C.R.A.P. principles from visual design first described by Robin Williams in her book *The Non-Designer's Design Book* (Whybrow, 2015). These principles are very similar to those for library guide design. C.R.A.P. stands for contrast, repetition, alignment, and proximity, which combine to help ensure effective communication of the message being conveyed through one's design. Contrast, sometimes the most important visual design technique, involves the use of contrasting design choices within font, color, sizing, spacing, and line thickness to create a more dynamic visual that emphasizes the most important elements within the layout. Repetition of these contrasting elements creates a sense of consistency and organization within the design, providing visual cues to the audience in an effort to help them better navigate through the layout. Alignment provides a visual flow and helps to connect the various elements on the screen. Lastly, proximity, grouping similar or related elements close together, reduces clutter and helps the user have a better understanding of the message being conveyed (Whybrow, 2015). Although all LibGuides are not required to follow these guidelines, the implementation of these practices can improve the overall usability, accessibility, and relevancy of the guide ("LibGuide Design...," 2022).

## Methods

The framework for this study was comprised of the five considerations for conducting usability tests described by Dumas and Redish: the objective is to increase usability, participants should be representative of the real target user group, the tasks should be realistic, moderators should observe the participants and record their actions, and analysis of the data collected should acknowledge all perceived problems and offer appropriate solutions (1993).

There were six stages included in the test design:

- 1. An initial participant recruitment survey was conducted to determine interest in taking the test and gain information on potential participant demographics
- 2. A pre-test survey was sent to and completed by participants prior to the start of their testing session
- Participants were read a script detailing the testing process and participant expectations

- 4. Participants completed the tasks under direct observation of the moderator
- 5. Participants were interviewed in person by the moderator immediately following the completion of the test
- 6. Participants were given the option to complete the two post-test surveys during their testing session or at their own convenience

#### **Pre-Test**

#### Participant Recruitment

In order to be eligible to participate in this test, individuals needed to meet certain criteria. The criteria included being currently enrolled in an RC 1000 course at Appalachian State University, being a first- or second-year undergraduate student and having little or no prior experience using the library website. These criteria were set to ensure that participants were realistic users, which means that they are either the target users of the product or design being studied or have a similar background to this target user group (Moran, 2019). In this case, realistic users of the library website would be students enrolled within the university. These criteria also made sure that the participants were not already overly familiar with how to complete the tasks. The goal of the test was to observe how newer users interacted with the library interface.

To accomplish this in the participant recruitment process, students from one section of an RC 1000 course were sent an initial participant recruitment survey. This survey both served to identify the ideal candidates for participation in this study according to the set criteria as well as aid in the testing process itself through making available individual participant information on which to base initial conversations in order to make the participants feel more comfortable (Mortensen, 2020). This survey collected the demographic information of the potential participants, including categories such as their age, year in school, major or intended major, preferred learning style, race, gender, course-enrollment status, and their current familiarity with the library website. By sending this survey only to those currently enrolled in an RC 1000 course, this ensured that the first criteria would be met. The information collected in the survey ensured that the second two criteria were also met, as potential participants had to disclose their current year in school as well as their current level of knowledge regarding the library website. They were asked to gauge their familiarity on a scale of one to five, one being totally unfamiliar and five being very familiar. The preferred familiarity status of selected participants was either a one or a two on this scale. This criterion was added in the hopes of eliminating participants with intermediate or advanced knowledge regarding the various resources available through the library website.

It should be noted that the RC 1000 course section from which the participants were recruited was taught by Dr. Savannah Paige Murray, Assistant Professor of Rhetoric and Writing Studies in the Department of English. This group was selected due to the ability to provide some form of compensation to those who elected to participate in the study. Chosen research participants typically receive some sort of compensation for their participation within a study. This can include financial compensation or some other incentive that acts as a "reward" for completing the test (Mortensen, 2020). Due to the limited time available to complete the study as well as the lack of funding for the project, it was decided that extra credit could act as a fair incentive for voluntarily participating in the study. Because Dr. Murray had the authority to give her student's extra credit for their participants could be given compensation for their engagement.

According to Jakob Neilson, five participants are all that is needed for a successful usability test (Neilson, 2000). In this article, Neilson asserts that "elaborate tests are a waste of resources," and that after the third user "you learn less and less because you keep seeing the same things over and over again" (Neilson, 2000). Again, due to the lack of resources available to run the tests as well as the relatively small scale of the study overall, it was decided that only five participants were necessary to obtain the necessary data. While more may seem better, after the first user, you will have already learned almost a third of what there is to be known about the usability (Neilson, 2000). Though more students were sent the initial recruitment survey and given the opportunity to participants signed up to be a part of the study.

In the description section of the initial recruitment survey, potential participants were informed that filling out the form would indicate that they were willing to take part in the study, but it did not obligate them to participate. Their participation was to be strictly voluntary. Details of the study, other than the website being tested, were not included in this description in an effort not to disclose information that may affect the results. However, a link was added to this description that led to a definition of usability testing as well as the benefits of such studies so that participants would be informed about what this process may entail. The contact information of the moderator was also included for use in case of any questions or concerns. The full list of questions included in the initial recruitment survey is found in appendix B, item B1.

While the library website is a user interface that can be used by all students, faculty, and staff, one of the objectives of this test was to determine how well students who are unfamiliar with the site could navigate through realistic tasks that they may need to complete during their academic career at Appalachian State. The areas covered within this survey would determine whether or not the participants fit into this target group while also collecting information regarding other user qualities that could potentially alter the user's experience, such as their learning style or their first language. This survey also gathered information that would allow the moderator to establish a rapport with participants before the beginning of the testing session, such as their major or minor. Best practice indicates that participants should be treated with respect and made to feel comfortable, so testing sessions began with a short and friendly introduction and conversation regarding the information that they included in this preliminary survey ("Running a...," n.d.).

#### Pre-Test Survey

Before each scheduled testing session, participants were sent a pre-test survey. They were informed that this survey had to be completed prior to beginning the test. However, they were allowed to take the survey in the usability lab if their schedule did not allow them to complete it ahead of their arrival. This survey was designed to establish a baseline for the participant's knowledge of and familiarity with the library website. This baseline was important because of the recruitment criteria that stated that participants were to have little or no prior knowledge of the library website or the RC 1000 LibGuide. This would ensure that participants were not overly familiar with how to complete the tasks before their individual testing sessions. This also established the participant's relationship with the library website so that this metric could be compared against the results of the test as well as against the participant feedback following the test.

This pre-survey was kept brief in order to not overwhelm the participant prior to their testing session. As previously stated, best practice for usability testing dictates that participants be respected and made to feel comfortable ("Running a...," n.d.). Incredibly indepth, invasive, or time-consuming questions can feel disrespectful of their time and could potentially cause them to feel less comfortable going forward with the study.

This survey received four responses from the group of five participants who had



Figure 3. This graph represents data on the participants' awareness of some of the library's online resources pulled from the pre-test survey.

Resources Used by Participants



initially agreed to participate in the usability test. The data gathered in this survey indicated that all of these participants were comfortable with using and navigating websites in general. While all four participants who completed the survey indicated that they had had some experience being on the library website, only one said that they had previously used the

Figure 4. This graph represents data on which online library resources that participants have previously used that was pulled from the pre-test survey.

various resources included on the site. The top three library resources that the participants

had previously heard about were the group study room reservations, the online academic

databases, and the "My Library Account" feature (Figure 3). None of the participants indicated that they had heard of either interlibrary loans or RAP sessions. Out of the ten resources listed, only two had been utilized by participants prior to this study: APPsearch and Library Guides (Figure 4). It should be noted that only one of the four responding participants indicated that they were aware of the existence of the library subject guides.

The significant discrepancies shown between these two charts indicate that, although students, even those enrolled for less than half of a semester, are aware of many of the online resources offered on the library website, few have ever made use of them. While the lack of time spent as a student may account for a certain amount of the disparity between awareness and usage, the fact that one participant was in their second year and only reported having used one of these features may suggest that this data could support the idea that the reason that students do not use these resources is not due to their lack of knowledge on the existence of these sources.

When asked if they had ever completed a research project or paper, three out of four participants replied that they had. Participant 1 chose the "Other" option, specifying that they had completed an outline for a research paper but was not required to complete the entire paper and so felt that neither "yes" nor "no" was an entirely accurate response. In response to the survey question asking what resources they had used to complete the aforementioned research projects, the top three answers included academic databases, news articles, and search engines, the latter being indicated as the top resource by all four responding participants (Figure 5).



resources participants typically used when doing research.

when attempting to research a topic using online resources. The participants had varying opinions on which aspect of completing a research project was the most difficult. One answered that distinguishing which sources are credible is often the most challenging part of doing research, while two others replied similarly, saying that finding good resources when doing research online is the most difficult aspect of this process. One participant disagreed, indicating that writing the paper itself is more difficult than aspects such as finding good sources or choosing a topic. When asked to explain why they felt this way, participants made comments detailing issues such as struggling with the integration of the "right information" into a research paper or having difficulty finding specific sources that directly address their topic of interest. In response to this question, participant 1 reported that "it was hard to find articles that [he] could tell were credible that did not explain things in terminology far too advanced for [him] at that time." These responses convey the sense that these participants, and those who they represent in the target user group, often have the most difficulty finding

and understanding resources that are both accessible and credible while also being relevant to their particular interests.

#### Participant Demographics

During this discussion of the test results, the individual participants will be referred to as either participant 1, 2, 3, 4, or 5. Three of the participants who had originally agreed to take part in this study identified themselves as female (participant 2 [age 18], participant 3 [age 18], participant 4 [age 18]) while one identified as male (participant 1 [age 19]). Participant 5 did not attempt to complete the initial survey; therefore, their age and gender identity is uncertain. All participants were either in their first or second year at Appalachian State University (Figure 6). All participants were currently enrolled in RC 1000 (Figure 6).

Participant Number	1	2	3	4	5
Year in School	Second Year	First Year	First Year	First Year	_
Major	Psychology	Biology	Exercise Science	Communication Sciences and Disorders	-
Minor	N/A	Judaic Studies	Public Health	American Sign Language	-
Enrolled in RC 1000	Yes	Yes	Yes	Yes	-
Course Delivery Format	Online, Asynchronous	Online, Asynchronous	Online, Asynchronous	Online, Asynchronous	-
Learning Style	Kinesthetic	Visual	Visual	Visual	_
Familiarity with Library Website (1-5 scale)	2	1	4	1	_

Figure 6. This chart depicts some of the data collected on participants who agreed to take part in the study. The data in this chart was pulled from the initial participant recruitment survey. This chart includes information about the participants' year in school, major, minor, enrollment status in RC 1000, the course delivery format of the RC 1000 course, their preferred learning style, and their familiarity with the library website on a scale of 1-5.

Although only five participants were needed for the study, the initial participant recruitment survey to collect demographic information and determine overall interest in the study was sent to an entire section of RC 1000 and received 19 responses in total. While the completed surveys of the respondents who did not participate in the usability test may not be relevant to the overall results of this study, some of their answers may be statistically significant and will therefore be included in the appendix. One such data point was that a majority of respondents, over 70 percent, identified their learning style as being "visual." Because the respondents were all first- and second-year students at Appalachian State and represented real users, this and other data points could indicate certain information about the target user group that could significantly impact their experience interacting with the online library interface. To view this additional data, see appendix A, item A1.

While five agreed to participate and signed up for time slots, only four participants completed the entirety of the study, including the initial participant recruitment survey, the pre-test survey, the test itself, the post-session interview, and the two post-test surveys. Though all of the participants indicated that they had been on the library website previously, only one expressed that they had used any of the various resources. The majority of the participants indicated their familiarity with the library website as being either a one or a two on the familiarity scale with only participant 4 selecting their familiarity as being a four out of five, which was defined as being "familiar with how to use the library website" (Figure 6).

#### Pre-Test Script

In order to maintain a sense of clarity and consistency between each separate testing session, a basic script was created to be read aloud to the participants before the test began. This script was based upon the script for a usability test that was conducted in 2006 on NC State's University Libraries website (Chang et al., 2006). The script included information about the testing process, participant expectations, and rules regarding questions. An emphasis was placed on there being no right or wrong way to complete the test as the website rather than the participants were being tested. Participants were also encouraged to think out loud during the test itself as this would provide more data. Using the technique of Concurrent Think Aloud (CTA) can provide a better understanding of the thoughts and actions of the participants as they occur but may also interfere with certain metrics such as the time on task or even the accuracy of the results. The Retrospective Think Aloud (RTA) technique, the method in which participants retrace their thought process after the session has ended, does not interfere with these metrics, but the increased time between verbalizing feedback and experiencing thoughts can lead to poor data, so the CTA technique was preferred ("Running a...," n.d.). To read the official pre-test script, please see appendix B, item B1.

#### **Usability Test**

#### Sessions

Each session was completed in person in the usability lab in Sanford Hall on campus. The time and date of each session was set by the individual participant, who was given a list of time slots to choose from as well as the option to set up a time outside of the designated list if necessary. Through this in-person moderated method, the exact time of completion rates could be accurately recorded, and outside observations regarding the body language and the outward expression of emotions of the participants could be noted by the moderator. While each activity was timed, participants were instructed to act as they normally would while completing the tasks and told that they were to complete each task at their own pace.
Participants were repeatedly assured that the website rather than the users were being tested, so they were not to worry about doing things right or wrong. Paper copies of the task list were given to each participant immediately after the moderator finished reading through the introductory script, and the tasks were read aloud throughout the testing session. Screen recordings were not conducted; however, all participant commentary was recorded along with other observations by the moderator.

#### Section I and II Task Design

The objective of this first section of the test was to observe how real users, in this case students, interact with the current design of the homepage of the library website. From the homepage, users are able to navigate to all of the many pages and resources the interface has to offer. It is important to design tasks that are realistic and likely to be performed by users outside of a testing environment (Moran, 2019). The tasks chosen for this section of the test were both specific and open-ended, allowing for a better understanding of how these resources may be utilized by the target audience. The tasks in this section included finding basic information regarding the regular functioning of the library as well as more specific tasks that had to be completed using the online resources.

The tasks were written in the form of scenarios which the participants could realistically encounter as a student. This was done to put the tasks in context so that the activity would feel more realistic and hopefully inspire the participant to feel more motivated to complete the task (McCloskey, 2014). Contextualizing the task "sets the stage for the action and provides a bit of explanation and context for why the user is 'doing X'" (McCloskey, 2014). Participants could also use this contextualization to see how these resources can be used in their own lives. As they were students, they could benefit from learning what these resources are and how they can utilize them.

The first several tasks involved very basic website navigation, requiring participants to begin on the homepage and search for information, such as the hours of operation and the contact information of a specific librarian. While being able to navigate the resources available through the online interface is important, knowing how to access the physical resources the library has to offer is important as well. Students can often find much of what they need through the various catalogs and databases on the website. However, some resources are located only within the physical library or are more difficult to access and understand. Under these circumstances, knowing when to go and who to speak to can be incredibly helpful.

The next few tasks revolved around using the online interface to book appointments, such as booking a research advisory appointment or reserving a group study room. Because group study rooms are regularly used by students, it is important that the scheduling interface for this resource is navigable to students who have never previously used it. By contrast, RAP appointments are an underutilized resource among the student population, and this may be due to lack of knowledge on what this is and why it can be useful for students. Confirming that students are able to navigate to the booking site and easily make an appointment could be a good first step in making the student population more aware of this library resource.

The final tasks in this section involved using the student's individual library account as well as the databases and catalogs. These are a significant part of the library's website, especially where students are concerned. These resources allow students to access materials and renew loans without needing to be physically present in the library. With the rise of online courses and distance-learning students as well as the advent of a global pandemic, it has become increasingly clear that the ability to access educational resources from one's computer is a necessity. The online databases and e-books available through this site also allow more students to access the same information at one time. These reasons demonstrate the need to test how easily a new user can access these sources and navigate through them. To see the full list of tasks from section I, see appendix B, item B4.

This second section took place immediately after the conclusion of the first. A brief pause was taken between the two sections to explain the objective of section II and allow time for the participant to navigate back to the library homepage as this was necessary for the completion of the first task. Time was also allotted for participants to take a water, bathroom, or snack break if they chose to do so.

The tasks in this section centered around using the RC 1000 Research Guide to accomplish a set of goals. Again, it was important that the tasks were realistic, and each was written in the context of a situation that may be encountered by the target user group (Moran, 2019). The tasks were again a mixture of specific and open-ended, allowing for the user to accomplish specific goals as well as interact with the LibGuide in a more flexible manner. The goal of this particular LibGuide is to help students who are currently enrolled in RC 1000 navigate the process of web-based research using the library website. Because of the nature of this guide, the tasks were designed to prompt participants to use the various resources included to complete some of the typical steps that go along with completing a research project.

There were six tasks included in this second section. The first task hinged upon the participant locating the guide itself. This was a simple navigation task designed to determine

how easily participants are able to access this resource. Because many of the participants had either never heard of LibGuides or had very little experience with this form of information sharing platform, it is essential that navigating to the page itself did not present a challenge. A difficult navigation path combined with little or no knowledge of the platform could contribute to low user interaction.

The following few tasks focused more on the act of beginning a research project itself. As this LibGuide is meant to help guide new students through the process of webbased research, it seemed pertinent to test how useful the participants found the resources and interactive content that was available on this subject. These tasks were less about accomplishing a very specific goal and more about observing how real users may interact with the content that was being targeted towards them as RC 1000 students. Participants were instructed to spend as much time on the individual tasks as they typically would and to feel free to make comments on which resources they would usually use and which they would skip over.

The final two tasks in section II were meant to test the relevance and usability of the database and citation resources on this guide. Participants were given more specific goals but were to accomplish the tasks in the context of their individual major or personal interests. By framing these tasks in a way that allowed participants to choose the topic of the article they were to find and later create a citation for, more realistic observations could be made about how they might use these particular resources in their specific fields of study. See appendix B, item B5 for the full list of the tasks from section II.

#### **Post-Test**

#### Post-Session Interview Structure

Participants were informed prior to the test that they would be asked a series of interview questions after the testing portion had been completed. To align with best practice guidelines for conducting individual interviews, participants were asked permission for the interview to be recorded before the interview began ("Individual Interviews," n.d.). These audio recordings were made to ensure that all commentary and feedback were accurately documented. Each post-session interview was to be completed in under ten minutes, and all participants were asked the same series of questions with different follow up questions depending on their individual answers. Again, best practice indicates that participants be treated with respect and their comfort be considered throughout the testing process ("Running a...," n.d.). In order to show respect for their time, interviews were conducted within the allotted time slot that the participants had signed up for. Participants were given the option to decline being recorded before and after their testing sessions to give them ample time to consider their level of comfortability.

While each interview followed the same basic structure, they were conducted in a conversational style. This alternative style allows interviewers to go off script and clarify the meaning of questions to interviewees. Research has indicated that this alternative style typically leads to increased accuracy in reports (Currivan, 2008). According to Douglas Currivan in his article on conversational interviewing, "because the same terms can have different meanings to different respondents, conversational interviewing may improve response accuracy by allowing unscripted exchanges between interviewers and respondents to clarify the meaning of specific terms" (2008).

These individual interviews allowed for additional probing that made it possible to gain a deeper understanding of the participant's experience and attitude ("Individual

Interviews," n.d.). Although the post-test surveys were also created with the intention of recording the individual participant's experiences and feedback, the stagnant nature of surveys makes it difficult to gain a deeper understanding of this kind of qualitative data. This is why the interview was conducted prior to the post-session surveys. It was thought that the open-ended and probing questions within the individual interviews would allow for more indepth thinking to be put into the responses to the post-session survey questions.

#### Post-Session Interview Questions

The questions in the post-session interviews were created to further assess the participant's individual user experience using both the library homepage and the RC 1000 LibGuide to complete the tasks. A rapport between the moderator and the participants was created at the beginning of the session and continued through the conversational style interview. This was done in the hopes of eliciting more honest and direct answers. It was essential that leading questions were avoided so as to not bias the answers of the participants (Babich, 2021). All questions were designed to be opened ended, prompting more than just a yes or no response. Participant responses were followed up with a related question, typically beginning with "why," in order to further probe into the underlying issues and feelings experienced during the testing process. Open-ended questions aid in the collection of qualitative data, as do follow-up questions (Babich, 2021). While additional follow-up questions were planned in advance, the conversational interview technique allowed the script to be more loosely followed, keeping the questions from feeling overly invasive which could make participants feel less inclined to answer honestly. See appendix B, item B6 for the full list of interview questions.

#### Post-Test Survey I and II

Immediately following their post-session interviews, participants were asked whether they would like to complete the two post-test surveys during their allotted time slot or later at their own convenience. By giving participants the option to complete the surveys on their own time without the pressure of the moderator's presence, the aforementioned best practice guidelines dictating participants be treated with respect and be made to feel comfortable were followed ("Running a...," n.d.). Although the amount of time necessary to complete the surveys would vary depending upon the participant's level of engagement, participants were informed that each survey would likely take approximately ten minutes to complete. Other best practice guidelines such as keeping the surveys as brief as possible and including a mix of question formats were also taken into account in the creation of these surveys ("Online Surveys" n.d.). When writing the questions, user satisfaction, likes and dislikes, participant suggestions, site navigation, and potential points of frustration were factored into their design ("Online Surveys" n.d.).

A combination of categorical, ranking, and open-ended questions were included in both post-test surveys. Because the task list was split into two sections, it seemed appropriate to split the final survey into two parts for both clarity and consistency. The first section focused on feedback and commentary regarding the participant's experience completing the Homepage Tasks. The vast majority of the questions were either multiple choice or select all that apply. Many of the multiple-choice questions contained an optional written response to allow participants the ability to further elaborate on their answers. Formatting the questions in this way cut down on the amount of time it would take to complete the questions while encouraging participants to actively engage and give thoughtful feedback to whatever extent they chose.

The second and final post-test survey, like the previous survey, aligned with the experience of completing the corresponding test section. Most questions were in multiple choice, rating scale, or select all that apply formats, with several allowing for additional written responses where applicable. Questions centered around satisfaction with the various content and features of the RC 1000 Research Guide, the participant's current understanding of the information contained within the guide, participant commentary on specific aspects of the guide, and other opinions regarding the structure of the guide itself. As there were more questions asking for feedback or commentary on specific content from the tasks, more open-ended questions were added into this survey than the previous one.

Both surveys were designed to elicit honest feedback and collect the majority of the remaining qualitative data before the end of the sessions. The final thoughts, attitudes, commentary, and level of satisfaction with the various tasks having to do with overall user experience were sought out through this final phase of each testing session, creating a more thorough and well-rounded data set for later analysis. To view the questions from both posttest surveys, see appendix B, items B7 and B8.

## Methodology

#### **Testing Type and Moderating Technique**

Participants within this study were intended to be first- or second-year students who were currently enrolled in RC 1000, the first-year rhetoric and composition course required for all students within the university. The objective in this usability study was to observe how real students might use the library website during their academic career within the university. This objective was accomplished through the implementation of a moderated testing style. This testing technique involves a moderator actively engaging in the testing process through using a test script which directs participants on the tasks that they are expected to complete. The moderator and participant can communicate directly with one another during the test (Katunzi, 2022). There are several advantages to this testing method, such as higher participant engagement, moderators having the ability to directly prompt the participants with questions, moderators being able to obtain further information regarding any issues encountered during the testing process, and the ability to observe subtle responses and behaviors which allows for a more detailed report on user experience (Katunzi, 2022). There are some disadvantages to this moderation technique, the most significant for this study being the observer effect in which participants may act differently when being observed than they would in private (Katunzi, 2022). Both the advantages and disadvantages were considered when deciding which technique to use in this study. The need for real-time feedback from the user base, the students at this university, outweighed the disadvantage of the observer effect.

Prior to the beginning of the study, an initial recruitment survey was sent out to collect demographic information, and a pre-test survey was sent to the participants who signed up for a testing session that was to be completed prior to the beginning of the test. This survey gathered information on the participant's current attitude towards and understanding of the library website and RC 1000 LibGuide.

As first year students are required to live on campus, and many students live very close to campus, in-person testing sessions were able to be conducted on university grounds. Due to the varied schedules of university students, participants were allowed to choose from a list of dates and times to schedule their session. For the convenience of the students, they were also informed that sessions outside of the set list could be scheduled with advanced notice. A neutral location was chosen for the session for the comfort and convenience of both the participants and the moderator. Each test took place in the Usability Lab located on the third floor of Sanford Hall. This lab contains several chairs, a table, and a desktop computer on which each test was conducted. This lab allowed each participant access to the same equipment and provided a quiet environment free of outside distractions. Prior to the beginning of the test itself, the moderator read from a script that detailed the expectations and process of the test. The tasks were completed under the supervision of the moderator, who was tasked with observing the participants and keeping track of the time it took for each task to be completed. Following the test, participants were asked a series of interview questions about their experience then given the option to complete the two post-test surveys during their scheduled session or later at their own convenience.

# **Test Results**

#### **Task Completion Rates**

The test metrics collected during the process included successful task completion rates, failure rates, and time on tasks (Figures 7 & 8). The first and second of these quantitative measures will be discussed in this section. A task was identified as being successfully completed when the participant indicated that they had found the answer or completed the goal laid out for them in the task list ("Planning a...," n.d.). As each task had a different goal, the requirements for completion varied depending on the task. The failure rates, the critical errors resulting in the inability of a participant to successfully complete a task scenario, also varied depending on the task. Both of these metrics are included in the following visualizations of the data:

## Section I: Homepage

#### Tasks



Figure 7. This figure includes the completion rates for tasks one through nine from section one of the usability test.

	Participant 1	Participant 2	Participant 3	Participant 4
Task 1	Yes	Yes	Yes	Yes
Task 2	Yes	Yes	Yes	Yes
Task 3	Yes	Yes	Yes	Yes
Task 4	Yes	Yes	Yes	Yes
Task 5	Yes	Yes	Yes	Yes
Task 6	No	No	No	Yes
Task 7	Yes	Yes	No	Yes
Task 8	Yes	No	Yes	Yes
Task 9	Yes	No	Yes	Yes

## Summary Data:

#### Section II: LibGuide Tasks



Figure 8. This figure includes the completion rates for tasks one through six of the second section of the usability test.

	Participant 1	Participant 2	Participant 3	Participant 4
Task 1	Yes	Yes	Yes	Yes
Task 2	Yes	Yes	Yes	Yes
Task 3	No	No	No	Yes
Task 4	Yes	Yes	Yes	Yes
Task 5	Yes	Yes	Yes	Yes
Task 6	No	Yes	Yes	Yes

#### Summary Data:

#### **Test Observations**

The homepage tasks with the highest rate of completion included tasks one through five, each having a 100 percent success rate. Each of these tasks had a navigational aspect, asking participants to locate information or navigate to a certain resource on the website. The total success rate of these tasks indicates that basic website navigation from the homepage is relatively intuitive and easy for first-time users to navigate without outside assistance. All four participants previously indicated that they felt comfortable in general with the basic navigation and use of online user interfaces and websites such as this one, and each expressed that they'd had some prior experience with using the library website, though only one conveyed that they had used any of the online resources prior to the study. This overall comfort level with basic website navigation along with some prior knowledge on the layout of the website may have increased the ability of the participants to complete each of the first five tasks both quickly and successfully.

The homepage task with the lowest rate of completion was task six. In this task, participants were given the following prompt: You checked out a book last month, and the due date is approaching. With all your homework, you haven't had time to finish the book. Find the page that allows you to renew the loan online. The successful completion of this task involved participants navigating to the My Library Account login page, logging into their student account, and finding the correct page that would allow them to renew a loan on checked-out library materials. While two out of the four participants indicated that they were aware of the My Library Account feature on the website, only one participant, participant 4, was able to successfully complete the task. Participant 4 was not one of the two participants who indicated their awareness of this resource.

Participants spent an average of two minutes and 37 seconds on this task before either successfully completing the activity or giving up. The average time spent until failure was three minutes and nine seconds. Both of these averages are higher than that of any of the other tasks in this first section. When faced with this task, all participants tended to hesitate for several seconds before attempting to navigate to the correct page. Some participants verbalized their confusion to the moderator while others displayed more nonverbal cues that indicated their initial confusion then growing frustration when they continued to be unable to

locate the correct page. Most participants immediately went to the services tab and failed to notice the My Library Account link under the borrow section on the front page. Making this initial decision led most participants to continue rapidly clicking through several different pages such as the technology checkout information and borrowing information pages. After two to three minutes of looking, two participants grew visibly frustrated and asked to be finished with the task, one participant navigated to the login page but was unable to figure out how to log in, and the last participant successfully completed the task. The observations and data gathered during this task indicate that, while the link to this webpage is on the homepage of the site, participants were unaware of what services are provided through this interface, causing them to skip over it in favor of looking elsewhere for a more obvious solution.

Several participants were also observed attempting to use the APPsearch feature to search for the service that would allow them to complete the task as well as several other tasks throughout their sessions. Some attempted to search for specific information or services using the Books and Media and Google Scholar tabs as well, neglecting to utilize the Library Website search tab. As per the post-session interview, participants indicated that they would likely only navigate through an average of three tabs or web pages before giving up and using a typical search engine such as Google. This data point may explain why several participants chose to give up on the task after spending over two minutes searching for the correct page.

The LibGuide tasks with the highest rate of completion include tasks one, two, four, and five. Tasks one and five were more site navigation based, which has proven to be easier for participants based on the results of the homepage tasks. Again, based upon the participant comfort level with general website navigation, locating features that have been specified by name seemed to be relatively easy for all participants. Tasks two and three had more loosely defined goals, intending instead for participants to interact with the guide in an exploratory capacity in order to observe their interaction and obtain their general feedback on the resources included and the organization of the page itself.

During these tasks, participants tended to ask questions such as "do I have to watch the videos"? These kinds of questions combined with nonverbal cues such as fidgeting, looking around the room, repeatedly scrolling up and down the various pages suggested that many of the participants felt unmotivated to complete a task without a very specific end goal. When asked later about their experience with exploring the resources on this page, participant 2 indicated that she would probably not have spent as much time looking at the information had she not been in the study. She clearly stated that being observed made her feel the need to spend more time exploring and trying to complete the tasks than she would normally. Several of the other participants made similar comments. This demonstrates the observer effect mentioned in previous sections. Here is a definitive instance in which being observed had an impact on the accuracy of the data. According to the participants, had these tasks taken more than a minute to complete or forced them to navigate through more than three or four pages, they would have likely given up and used an outside search engine had they been on their own in a private setting.

The LibGuide task with the lowest rate of completion was task three, involving the use of the Interlibrary Loan program. Like the task with the lowest completion rate of the previous section, this task requested that participants use a service that they had no previous awareness of. This means that participants had to use their navigational skills to achieve a

goal that they were unfamiliar with. The observations from this task were similar to those in task six of the homepage section. Participants often paused briefly, vocalizing their confusion in various ways. Several clicked through every tab on the side navigation page looking for the information on interlibrary loans, often neglecting to scroll through the pages thus causing them to skip over the information several times. One participant skipped using the LibGuide completely, opting to navigate back to the homepage and try to find it from there instead. Two participants located the login screen, however only one was able to successfully log in.

The average time until failure for this task was approximately two minutes. During these two minutes, the participants grew increasingly frustrated, sighing, shifting repeatedly in their seats, and rapidly clicking through pages. The observations from this task as well as that of task six from the first section are indicative of the fact that the participants, while having the ability to navigate relatively quickly through an unfamiliar website, are often unable to do so when they are unfamiliar with the goal or end-destination of the task. They understand the basic concept of making an online appointment or searching the catalog for a specific book, but they find it much more tedious to explore more unknown resources, often making statements about how they would likely not even try to use the less understood sources in favor of searching for exactly what they were looking for on Google. This was made especially obvious when the participants attempted to use the APPsearch bar on multiple occasions to find a certain feature. It seemed as though they assumed that because this was the most prominent search bar on the homepage, it must allow one to search the entirety of the website. Much of the feedback given throughout each of the sessions was in

52

regard to this apparent need for a more convenient way to locate exactly what they are looking for.

#### **Time on Tasks**

For the time metric, the amount of time spent on each task was recorded during the four individual sessions. This data was then collected and used to calculate the average time spent successfully completing each task, the average time before the participant failed to



complete the task by either not reaching the goal or giving up before it was completed, as well as the average of the time spent on each task including both successes and failures. Tasks which

Figure 9. This graph includes the data on the average amount of time spent by the participants on each task in section I of the test.

took each participant under a minute to complete are typically regarded as including features which are easily understood and navigable by the target user. Tasks that took several minutes to complete or that resulted in failure should indicate that the features included in the task are

either difficult to understand or not functioning as intended.

This first visualization includes the data collected on the amount of time spent on each task in the homepage section (Figure 9). From this, it is more visually obvious that the first five navigation-based tasks were completed at a much faster rate than tasks six through eight. The average completion time of these tasks is much lower than the average time until failure and somewhat lower than the average time spent on the task overall. This indicates that it took participants longer to fail to complete the task than it did for participants to reach a successful result.

Like in the previous visual, the data shows that on average it took participants more time to reach a failing or incomplete result than it did for participants to successfully



complete the task, although this is slightly less clear from the results of this section (Figure 10). Task three's average rates are all similar, with the average time to failure just surpassing the other two measures. Just under two

minutes seems to be the amount of time that participants are willing to spend attempting this task overall whether or not they succeed. Other data points from this metric include the amount of time each participant spent on tasks from both sections and the amount of time each participant spent on the test overall (Figures 11, 12, & 13).

Figure 10. This graph includes the data on the average amount of time spent by the participants on each task in section II of the test.





Figure 11. This graph displays the data collected on the average time needed to complete all the Homepage Tasks from section I for participants one through four.





Figure 12. This graph displays the data collected on the average time needed to complete all the LibGuide Tasks from section II for participants one through four.





#### **Post-Session Interview**

The information collected during the post-session interview indicated that, while participants felt that the majority of the website and LibGuide were easy to navigate, there were a few areas they felt could be improved upon. Although most participants were able to locate a majority of the features, several expressed frustrations with how many pages they had to look through to locate certain resources, especially those that they had little to no knowledge of prior to this experience such as requesting interlibrary loans or using their online library accounts. For these participants, their lack of familiarity with these resources made the website feel less accessible. They felt that, if they did not know about something beforehand, they would be unable to locate it or would at least be less inclined to try. One proposed solution to this problem was the addition of a search bar that would allow users to search the entire site for various resources. While this does already exist, it should be noted that none of the users were able to locate it and instead repeatedly tried to search using the APPsearch bar. When asked later about this, participants indicated that this placement was not intuitive and would be much more effective if placed in the upper right-hand corner, a place where search bars are often found on other websites.

Most of the feedback obtained from these interviews revolved around making the website more convenient for student use. The participants' main issues lay in the discrepancies in the level of convenience between using the library website to find information as an undergraduate student and using a popular search engine like Google. Many of the comments throughout the testing process itself as well as the individual interviews consisted of how they would typically just use Google to complete the assigned task "because it's just faster." Participants confirmed that, although they probably could figure out how to use the many features the library has to offer, they would probably just choose to find information in a different way or physically go to the library itself to ask for help. The interviews served to point out the main reasons why participants may choose to use a different method for conducting online research and provided several ways in which this issue can be combated according to members of the target user base.

#### **Post-Test Survey Section I: Homepage Tasks**

The data collected in this first post-survey coincides with many of the findings of the post-session interviews as well as the observations made by the moderator throughout the testing process. Tasks which took participants several minutes to either complete or give up on were rated as being the most difficult. Tasks six, seven, eight, and nine were consistently ranked as being most difficult with participants indicating several reasons for why this was. One participant felt that the layout of the website made it difficult to find the correct page while another said similarly that they felt they had to click through too many pages to find the right one. The other two participants felt that certain links were not descriptive enough, thus hindering them from quickly finding and utilizing the resource.

While all the participants agreed that, overall, the tasks were not overwhelmingly time consuming, there were mixed responses on how intuitive they found the site to be and how easy it was to locate everything. Most indicated that it was moderately easy, with one participant answering that they felt it was very easy. One a scale from one to ten, one being not at all self-explanatory and ten being very self-explanatory, all four participants chose a different number to rate how intuitive the website and steps to complete each of the tasks were. Each participant rated the intuitiveness of the website at either a five, six, seven, or eight.

Overall, participants expressed that they felt that they would use many of the resources that they used for this test, with only one saying that they did not feel inclined to use most of the resources available to them through this site. The top four resources that were

indicated as ones which they would potentially use in the future included APPsearch, group study rooms, the various academic databases, and the LibGuides. None of the participants felt that they would use the Chat Assistance feature, the interlibrary loan program, or the online library catalog in the future.

As was conveyed through the various test metrics, the first several tasks, tasks one through five, were relatively simple for each of the participants, with most of them identifying these tasks as somewhat easy, easy, or moderately easy. In contrast, task six, the task that proved to be the least successfully completed, was called somewhat or very difficult, and all four participants felt that they would rather renew their loans in person rather than through their library accounts. The following tasks were ranked as mostly moderate or easy, and participants seemed to have fewer issues with these, although one participant felt that the catalog did not work as they expected.

Overall, the majority of feedback seemed to again revolve around convenience as well as some issues with linked content. One of the main complaints was that the title of a link did not accurately reflect the content and that being more descriptive would make resources easier to find. This was felt to be especially important in the library catalog, which many of the participants initially struggled to decipher. Another suggestion was the addition of more sorting features that would allow for an even more refined search. This would decrease the amount of time spent scrolling through the catalog to find materials. Other suggestions made at the end of this survey followed a similar vein, proposing changes such as reorganizing the homepage into drop down menus to make the amount of links and other information less overwhelming along with additional requests to create more descriptive links. Participants gave the library homepage a moderate score on their level of satisfaction. On a scale of one to ten, three participants placed their satisfaction level at around a six or seven, with one placing it higher at a nine. The overall consensus seemed to be that the website was easy enough to use, but there were changes that could be implemented that would make the experience better overall for the users.

#### Post-Test Survey Section II: LibGuide Tasks

The results of the second post-test survey were somewhat similar to the first, with participants expressing their overall satisfaction with the current setup of the RC 1000 LibGuide while also providing feedback on how this page could be improved to better serve the target user group. Satisfaction scores were much like that of the homepage, hovering around a score of five to seven with one participant placing their satisfaction level at a nine. Overall, participants seemed to find these tasks a bit more difficult than those of the first section with tasks three, five, and six ranking at the most difficult, coinciding with the results observed in the various test metrics from this section. In response to why these higherranking tasks were more difficult, participants made comments on navigation and titles as well as the fact that some of the resources were more difficult to find due to the fact that they had never used them before. Participants seemed to be in disagreement with how time consuming they felt the tasks were, each submitting a different response indicating ranging from yes to moderately to no.

Most of the participants felt that the information in this LibGuide was either somewhat unclear or neutral in how it was presented and that it was only somewhat helpful in completing the tasks. This was due to varying factors such as what some felt was unclear organization and vague tab titles. One participant disagreed with this, stating that they felt that the information was helpful, descriptive, and clearly formatted similarly to a typical research paper. Although there were mixed opinions, three out of four felt that the guide was useful overall and made several suggestions that could serve to improve the level of usability. These suggestions included changing the organization of information, including clearer directions to helpful sources, and adding more drop-down menus. One suggestion indicated that the title of the LibGuide itself was not descriptive enough, and they later expressed that they felt that this title may make students who are not currently enrolled in RC 1000 feel less inclined to use this resource. All the participants felt that having more specific names for LibGuides would likely make them easier for students to find and utilize. Linking LibGuides directly to the homepage or adding them on to AsULearn were also indicated as being ways to make these resources more accessible to students.

The interactive content and informational resources included in this guide received varying feedback. While several participants chose to click on the videos, rather than sitting through the entire video, they skimmed through the majority, only stopping on the information that they thought was most relevant. When it comes to video content, two participants indicated that they would typically be willing to watch around two to four minutes of a video. The other two participants indicated times just above and below this, one saying they would be willing to watch between four to six minutes while the other felt that they would only watch around one or two minutes if they felt that the video may contain useful information. The tasks involving identifying sources, using the APPsearch feature, and using the interlibrary loan program were met with mixed reviews, with most participants finding the information on these resources somewhat or moderately helpful. When asked

what kinds of interactive resources they would find the most helpful, the highest rated answers games and videos, with quizzes and interactive models coming in second.

Some of the more comprehensive feedback about the LibGuide involved additions or changes that could be made to create a more streamlined experience for the user. Most participants tended to prefer organization that coincided with how they would typically go about the process of completing a research project. While many of the tabs did align with the typical process, some small changes were suggested about the last few tabs. Participants also preferred having clear and well-defined directions on how to complete processes such as creating a citation in a specific format, using the databases to find a particular kind of material, including a template for how an essay could be formatted, and adding information on how to determine the type of source that one is citing.

Much like the previous survey, it was clear that the participants were relatively adept at navigating through user interfaces, even those that are unfamiliar to them. However, there were several areas that participants felt could be altered to better fit their needs. As members of the target group for a guide such as this, feedback like this could be invaluable to creating a more relevant and usable library guide for first- and second-year students. Like in the last section, there was an emphasis on convenience. When asked why he did not want to watch the videos, participant 1 stated that he was "not interested in using that time," and when asked what they would change, participant 3 indicated that they would want to "create a less time-consuming way of helping students find resources." All four participants, in response to a question on why students may not want to use LibGuides, explained that students would usually gravitate towards using search engines like Google because they can find exactly what they are looking for as soon as they search for it. While the participants acknowledged that this method of research may not always be the most reliable, they still felt that the convenience and speed of using a search engine that they are well versed in is usually more appealing than attempting to wade through the much more intimidating mass of information that one finds when searching through a university library interface such as this one. While search engines typically generate an overwhelming amount of information, participants felt that it was often easier to digest than the more academic resources and databases. By implementing some of their suggestions to create a user interface that better aligns with the current mental model of an undergraduate student, students much like the participants may be more inclined to attempt to navigate through the more unfamiliar terrain of the library website to find the credible and relevant information that they are searching for.

# Discussion

In analyzing the results, it was helpful to compare the test metrics with the interviews, surveys, and observations made throughout the testing process. While the time metrics may be somewhat indicative of the difficulty level of completing each task, especially when combined with the completion and failure rates, the high rate of completion of each task and the relatively low amount of time spent during each section suggests that participants did not have an overly difficult time navigating through the website. Those metrics along with the satisfaction ratings for both the homepage and the RC 1000 LibGuide convey the sense that the overall usability of the website is at a satisfactory level. However, observations made during the sessions on participant performance and body language combined with feedback and commentary from the surveys and post-session interviews suggest that there are changes that could be made to slightly improve the usability of this website and better serve the needs of the target user group.

As the participants all came from different academic backgrounds and had differing interests, the way each went about completing this task varied considerably, giving a more accurate representation of how students from all different majors may use this resource. This is significant because all students, regardless of major, are required to earn the RC 1000 course credit to graduate, meaning that students from all majors could be accessing this LibGuide. Because of this, it is important that the processes and resources described in this guide are navigable and usable for students with a wide range of academic abilities and goals. Issues that could be addressed to better serve the needs of these students include the unclear link titles, certain layout and organization choices, confusing features, and the disparity between the online library interface and popular search engines in terms of the level of convenience.

#### **Unclear Link Titles**

One of the most consistent comments made by participants throughout both sections of the test were regarding the links. While many of the links on the homepage and LibGuide were simple and easy to understand, participants found that if they were less familiar with the service, the links seemed to be much less clear. This led to many participants skipping over the correct links and instead clicking on those that they felt more familiar with, causing them to complete the task in a very roundabout manner or sometimes not complete the task at all. The more links and pages that the participants had to click through to successfully complete the task, the more visibly frustrated they became. Most participants stated that they would usually only click through around three pages before giving up and using a popular search engine to find what they were looking for. This feedback suggests that, while many of the links are easy to use and navigate through, according to the participants, some of their usability relies on the fact that the user knows exactly what they are looking for. This issue increased the time spent and lowered the completion rate for several of the tasks. Task six from the first section and three and six from the second section proved to be more challenging due to the participant's lack of familiarity with certain features.

At the beginning of the testing sessions, participants were all relatively unfamiliar with most of the website's features. However, many of the tasks asked that they navigate to features that are often included in most user interfaces. Because of their comfortability with navigating through websites in general, these tasks, such as finding the library's hours of operation or locating the contact information of a staff member, were easily completed by all the participants. When faced with tasks that requested they do something they had never done before, participants tended to hesitate and grow frustrated much more quickly than in previous tasks. Task six from the first section, in which participants were asked to find the page that would allow them to renew a loan, proved to be especially difficult. Because they were unfamiliar with the My Library Account feature, participants did not connect this resource with renewing their loans and consequently did not click on this link on the library homepage. In the post-session interview with participant three, she mentioned that she was surprised that she knew how to do so many of the tasks, but she also felt that when she did struggle, it was due to the indistinctive links and labels for resources that she was less familiar with.

Tasks three and six from the second section of the test led to similar results, causing participants to grow frustrated with the interface, increasing the time spent on the tasks and lowering the completion rates. Task three, much like task six in the previous section, asked participants to use a feature that they had never heard of before, the interlibrary loan program. There are several ways in which one may access this resource, including a direct link from the RC 1000 LibGuide as well as a link found under the "More Services for Students" section of the Services for Students page. While both of these paths seem relatively short and simple, participants obviously found this not to be the case. As they were not familiar with the resource prior to the beginning of this test, locating information about it proved to be much more difficult. Participant three felt that this was the most frustrating out of all of the tasks as she had never heard of the resource before and "didn't even know where [she] was supposed to go." Some abandoned the idea of using the LibGuide at all, returning to the homepage and searching through the borrowing section while others repeatedly searched through the tabs of the LibGuide, with only one both locating the link and figuring out how they could log in. While all of the participants indicated that they were comfortable with navigating through most websites, several still failed to locate the paths necessary to successfully complete the task. When asked why this was, participants explained that, because they didn't know what the resource was, they weren't sure where to find it, and the names of the tabs in the LibGuide did not feel descriptive enough. Participant two indicated that she felt that several of the tab titles were overly similar, causing her to open the same tabs multiple times as she could not remember which resources were included where. Participant three said something similar, stating that "three of these titles talk about sources, so I didn't know exactly what I should be looking for."

Task six of this section followed similarly, with participants repeatedly searching through all the various tabs on the LibGuide rather than immediately clicking on the "Additional Information" section. Participant one commented on this, stating that he did not understand why the citation information would be categorized as "additional" as he felt that this was an integral part of the research process. Other participants made similar comments about this and the other tab and link titles. While all participants eventually were able to locate this information, several stopped mid-task to ask if the information they were looking for was even included on the LibGuide. Participants felt that the organization and naming of categories conflicted with their expectations, leading to increased task times. It was noted that the implementation of more straightforward tab titles such as "Citations," as well as the combination of like categories could add to the overall usability and navigability.

With so many of the target user group being unfamiliar with many of the more academic aspects of the interface, and with many of the databases and other resources already being less accessible to non-academics and undergraduate students due to the advanced vocabulary of scholarly resources, it is important to keep in mind that users may not be familiar with such features. This lack of knowledge can create a barrier to entry, negatively impacting the usability of the interface and thus the experience of the user.

#### Layout and Organization

Another of the main sources of frustration for the participants was the "overwhelming" amount of information on the homepage, as well as several other areas throughout the site, including the page where one would locate all of the various subject guides. The amount of information on these pages caused participants to become confused and unable to sort through everything to find the specific information they were after. The layout and organization of the site, while being simple enough for users to locate the features they were familiar with, again hindered the ability of the participants to locate the less obvious and well-known resources.

Several comments were made throughout the testing process as well as during the post-session interviews regarding how slightly altering the organization of the information could increase the level of intuitiveness of the design. For example, in task three of the first section, participants often took the more roundabout route to locating the contact information of a librarian, going to the Visit tab at the top of the page then deciding to click on the Contact tab before going to the Faculty and Staff Directory and finally landing on the Find Your Librarian page. While there is a link directly to this page under the Connect section of the homepage, participants indicated that the volume of information on this page led them to gravitate towards the top navigation bar instead. When they got to the Find Your Librarian page, most participants hesitated slightly, some verbalizing their confusion about which librarian they should pick, commenting on how many there were to choose from. When asked about this layout later, several indicated that they would usually prefer drop down menus over long lists, as the list format can feel more overwhelming due to the increased amount of information, much of which was irrelevant to their search. In her interview, participant three commented on this, saying that the amount of information on the main website page as well as in the library catalog threw her off. The "wall of text" was a bit intimidating, and the amount of numbers and titles all at once made her feel lost. Participant four commented on this also, saying that "having all of the information out at once" made it feel like the various sections were competing for her attention. While this did not significantly raise the amount of time spent on this task, participant feedback indicated that having all this information laid out in one place was rather intimidating and could contribute to their tendency to gravitate away from a library interface such as this one and towards a search engine.

This issue of organization continued in the RC 1000 LibGuide where several participants pointed out that they felt that some of the information could be rearranged in a way that more closely resembled the typical process of completing research as an undergraduate student. In an interview conducted with the author of the current RC 1000 LibGuide, Mark Coltrain, he made a point to mention that he did not want to force a certain order of operations on the students that used the guide. However, the participants in this study felt that introducing more step-by-step organization could make it more streamlined and easy for students to follow. Because the intended audience for this guide is students in their first or second year of their undergraduate degree who are just beginning to learn the process of completing a research project, participants felt that giving the information more of a structured approach would add to the usability of the LibGuide and make it more accessible. The participants made several suggestions about how the information could be rearranged to better fit their mental model of how students typically write a paper. The majority of the comments that participants made surrounding this section of the test involved changing the organization, which was indicated as being the best way to help students both find and use the resources that are available to them.

### **Additional Issues with Features**

Some of the features included on the website had a few additional issues. Several of the participants struggled with using the online catalog, especially when using some of the more advanced search features. One of the main issues revolved around using the search by title feature. All of the participants decided to search by the title rather than by a keyword. This meant that if they included a misspelled word or did not include a word in the title, they were redirected to a different page that indicated no matches were found. This lack of flexibility in the search feature led to increased task times and contributed to the frustration of the participants. Participant two, after struggling with this feature for several minutes, gave up, indicating that they would not have usually spent that much time trying to make the page work and would have instead gone to Google or to the physical library for help. Three out of the four participants indicated that they felt the set-up of the catalog was confusing and that too much information was included on the page, making it difficult to locate exactly what they were looking for. Another issue was found in the Find Your Librarian section. When participants went to obtain the email address of whatever librarian they had chosen by clicking on the Email me link, they were redirected to Outlook rather than merely being given the email address. This caused confusion in several of the participants, leading them to give up on finding the email addresses and instead only obtaining the office phone numbers.

Throughout several of the tasks, there were instances where participants attempted to use the search bar under the Search section to find information on how they would renew a loan or find a book. While the search bar has several tabs that indicate which area of the website one would be searching through depending on which was selected, three out of the four participants did not recognize the difference between these tabs, with only one out of the three attempting to change the selected tab. Participant one suggested that a search bar be added to search through the entire website, indicating that he was unable to identify the final Library Website tab on the search bar as being the resource he was looking for. When asked about this later, he explained that this was not where he would expect it to be and that he would have made this the default setting rather than APPsearch. To him, and to several other of the participants, the APPsearch title suggested that one would be searching through the website, rather than the databases of articles that it was actually searching through.

## Lack of Convenience

Overall, the most common feedback received was in regard to the difference in convenience between using the library website to locate information and just searching for the information on a search engine such as Google. Again, the time metrics and successful task completion rates both indicate that this website's level of usability is satisfactory. However, despite this, participants expressed that they felt that most of the student population tended to gravitate towards using other means of obtaining information. When asked why this was, all of the participants mentioned that they felt that this was mainly because of the convenience of using a search engine. Search engines tend to be a fast and simple way to find the niche information that one may be searching for while researching a specific topic. Rather than wading through tens of databases and thousands of articles that may or may not have something to do with the subject of one's research, students prefer the ease of making a simple search and clicking on the first relevant source they can find.

At several points throughout their sessions, participants made comments indicating where they would typically have stopped trying to use the website and instead gone onto Google. The main instances of this happening were when participants had spent longer than about a minute and a half trying to find a particular resource or when they failed to successfully complete a task. Participant three commented on this, saying that she feels that students just prefer the convenience of search engines because they are overall just less time consuming. She acknowledged that the library website was "just like two extra steps," but to her, those two extra steps were often two too many. She said "when you go into Google, the first thing you type in you get a bunch of different resources, but maybe like on here [the library website] it's going to throw you off to an article just because it has the name in it. I feel like Google is easier to read too." Participant four agreed, saying that having to go through the many pages and various databases to find an article that might have what you are looking for is much more time consuming than just being able to make a simple search and find the answer. She said that "if the library website is something that you've used before, it might be more convenient, but if it is something that you have never used before, it will probably be something that you don't want to use." As participant two said, "Google is Google. I've used it since I was in middle school. I've never used a library website...It's more convenient to search and have it right there...I hate having to click a link and then search around more after that."

It seems obvious that the main issue that participants had was about the differing level of convenience between this website versus a search engine that they are already familiar with. The participants felt that this website was not overly difficult to navigate and had several features that they liked, and they acknowledged that using the databases and other resources on the site to find information would mean that they could ensure more accuracy and credibility in their research. However, the main issue holding them and the target user group back is the fact that there is a learning curve that they don't experience when using a simple Google search. Generally, participants seemed to rate convenience as the most important aspect of design, and much of their feedback revolved around how making changes that improve the level of convenience would likely make students more willing to use the many resources provided to them. The current mental model of the user base is such that ease of use and the speed at which information can be obtained is an integral part of creating a positive user experience. Implementing changes that improve these aspects of the interface would serve to make the website more accessible and usable for students, creating a better overall experience for the target users.

#### Interview with Mark Coltrain, RC 1000 LibGuide Author

To gain a better understanding of the design of the RC 1000 LibGuide in its current form in preparation for making recommendations for potential improvements, an online interview was conducted with the librarian who had most recently updated it, Mark Coltrain. This was done with the intent to gain insight into the how and why of the current design and content so that any recommendations could be made with this background information in mind.

The interview began with a list of broader questions that went over the more basic decisions included in the creation of the LibGuide. In response to the first question, which asked about what prompted him to design the guide as well as who the guide was designed for, Coltrain explained that, although there was already an existing RC 1000 guide when he arrived at Appalachian in 2019, he felt that it could use a bit of an overhaul in terms of what topics were being emphasized. This led to a redesign in 2020, which coincidentally coincided with the COVID-19 pandemic that forced many students into an online asynchronous learning environment. The redesign was done with several criteria in mind: emphasizing the RC 1000 program's course and learning objectives, observing the interactions of RC 1000 students in a library or research instruction context, observing the interactions of RC 1000 students within one-on-one research appointments, and incorporating the knowledge gained through conversations with other librarians and RC 1000 faculty members. While the first update by Coltrain occurred in the summer of 2020, significant updates have been made in both 2021 and 2022, Although this guide was created expressly for student use within the RC
1000 course, he felt that it could be useful for all those who are new to the research world in general.

When asked about how he went about redesigning the previous guide, Coltrain said that his first step involved "reviewing the previous RC 1000 guide and deciding what to keep and what to cut. From there, [he] tried to prioritize what [he] considered the most important content and look for engaging ways to present it." As noted in the explanation on the physical layout of the guide, much of the content comes from both outside sources and from sources within the university itself. He made a concerted effort to include content that was both informative and engaging, including several interactive design learning objects which "offer more context to nuanced topics that can be hard to explain." While he did consult with several faculty members regarding the design at various stages, he did not include student feedback in his planning process. He made the assertion that, although he had not used student input originally, he feels that this kind of feedback should be central to the creation of resources such as this one which are targeted towards the student population. Although there may be a perception that getting honest feedback from a representative sample of students would be difficult, doing so could make these resources significantly more accessible and usable to their primary audience. Using usability testing on LibGuides could be a way to create a better experience for the target user in this case. Though no usability testing has been done up to this point, he did make a point of saying that the regular implementation of this kind of testing could prove to be advantageous.

In terms of designing the actual guide, Coltrain stated that when deciding what to include, he tried to think about the major parts of the process of what he would typically go over in an instruction session. These major parts, such as developing a topic and finding sources, of course coincide with many of the processes involved in beginning an actual research project. While he does say that the topics could arguably be reorganized, he tends to shy away from forcing a specific order of operations for how one must go about this process. The guide itself does seem to be rather thorough in what content and information was included, however, he does feel that there could be additions made. This is another instance where discussing this with students may be beneficial. At this point, Coltrain made a tangentially related point regarding a conversation he had with a colleague about the current approach to teaching students how to research:

She has a lot of fresh perspectives and ideas that made me question my approach over the years. I think a lot of educators (myself included) have been unwilling to accept or even just be open to other ways of doing things like research. I realize there is a large gap between how I conceive of interacting with and gathering information versus the conceptions of first and second year students. And my way isn't always the best or most efficient way. This is also true of the professors who are assigning the research projects, [by the way].

He admits that many of the online resources provided by the library are "awful from a usability perspective," and there are some librarians who are pushing vendors to make their product designs more user centric. This coincides with his later point on the lack of open access to the information that exists within the "for-profit/subscription-based" databases. These resources that students are only able to access through their library are often confusing to navigate and thus keep that content inaccessible as a result. This seems to be a major reason behind why so many students turn to tools like Google which are convenient and easy to use, especially in comparison to the more difficult library tools. He ends by saying that "at

the end of the day, a LibGuide is just a tool. It will really take open-minded professors, librarians, and students working together, talking to each other, and learning from each other about the best sources and best approaches to finding and using sources. Students are experts, too, and they have a lot to teach professors and librarians." This kind of open-minded thinking and shift towards student and faculty collaboration can hopefully lead towards a system of education that focuses more on how students actually think and learn rather than how teaching and research has been done in the past.

### Limitations

While the results provided by this study do provide insight into the overall usability of the library website as well as how the current target user base interacts with its many features and resources, there were limitations placed upon both the creation and implementation of the test that could have impacts on the research.

The first limitation was the lack of funding. Due to this being a student research project without an associated grant, the entire testing process had to be completed without the aid of financial assistance. This meant that no supplementary equipment was purchased, no additional team members could be hired to assist during sessions, and no monetary compensation was awarded to participants. The combination of these factors added to the overall difficulty of conducting the study. Due to the lack of any monetary compensation for participants, finding a reliable group of student participants who were willing to take an hour out of their busy schedules to take part in a student-led study became problematic. Although compensation was given in the form of extra credit, this seemed to have less of an impact than some other forms of payment could have. Due to this issue, only four willing participants were tested, with a fifth signing up and later opting out the day of their session. While the test could have benefitted from having more participants, the results of the study should still be considered statistically significant due to the fact that, after the first participant, one third of the information you can learn through the usability test has already been collected. Additionally, after the third participant, the majority of the data had been gathered, and the more users added, the less learned during each additional session (Nielsen, 2000).

An additional issue caused by the lack of available funds was the inability to pay additional team members to aid in the actual testing sessions. This meant that only one person was in charge of moderating the test, making observations, taking notes, setting up pre and post-test surveys, timing the completion rates of each task, and conducting the postsession interviews. Because of this, the amount of detail of the observations and notes may have suffered, and the testing experience of the participants could have varied more significantly between each session than they would have had more team members been assigned to specific roles. The ability to pay others to take on some of the responsibilities of running the studies as well as having the funding to pay for equipment that is specifically made for usability studies could have a positive impact on the accuracy of both the quantitative and qualitative data collected. While the data from this test should again still be considered significant, future tests could benefit from these additions.

The small time frame in which this study had to be completed led to other difficulties. While there was around two months to complete the research, planning, testing, and write-up of the results, the testing portion of the project proved to be more time consuming than originally anticipated. This was mainly due to the difficulty faced with recruiting participants, and the subsequent issues with scheduling the sessions themselves. This meant that the actual testing portion of the project was stretched out to around a three week window in which data was collected, with an additional week added in an attempt to repeatedly reschedule the canceled session with the fifth participant. Because of this delay, the write up of the results, the analysis of the data, and the recommendations were pushed back on the time table. While everything was able to be completed within the allotted time, the analysis and recommendation sections could have benefitted from the additional time that the testing portion ended up absorbing.

In addition to these previous limitations, the actual structure of the test itself posed another problem, namely the observer effect, which causes participants in a study to behave differently while being observed than they would alone (Katunzi, 2022). While participants were asked to complete the tasks as they normally would outside of a testing environment and assured that their process was not being tested, the mitigation of this effect is difficult without the implementation of more sophisticated observation techniques and research instruments (de Bianchi, 2018). Due to the lack of funding, materials, and additional researchers, this effect will likely have impacted the behavior of participants.

In future projects, applying for a grant to help alleviate some of the issues caused by the lack of funding and planning for scheduling issues with the testing sessions themselves would allow for an improved version of this study. This was the author's first attempt at completing a project such as this one, and there is certainly a learning curve, but despite these limitations, the results gathered can still be used to examine how best to serve the needs of the students through the application of human-centered design in a world that is increasingly reliant on technology for both education and research.

### Recommendations

The following recommendations are made based on the results of this usability test, including the test metrics, the pre and post-test surveys, the post-session interviews, and research on this subject. The implementation of these recommendations is intended to create a more convenient, accessible, and user-focused experience for the students who use the many online resources on Appalachian State's library website. These proposed changes will be made in order of "severity" based on the impact that the corresponding issues have on the overall user experience. There are three categories for which each of these recommendations will be organized under: Critical (leads to task failure; causes user extreme irritation.), Moderate (causes occasional task failure for some users; causes delays and moderate irritation.), and Minor (causes some hesitation or slight irritation.) (Sauro, 2013).

### Critical

Recommendation 1: Add a "Library Website" search bar to the top right corner of the homepage.

The first recommendation is to include a full site search bar in the top right corner of the page (Figure 14). This change has been identified as critical due to the fact that students repeatedly attempted to use the already existing search bar to look up various website features and were unable to do so due to the current layout. Students made note of this multiple times, commenting repeatedly on the fact that the search bar was not where they thought it should be. Additional comments were made on APPsearch being the default for the current search bar. Search bars on websites are typically at the top right, so moving the Library Website search bar here would help user expectations be met and allow for easier navigation. Two of the main issues that users had with the website were the lack of convenience and the inability of users to locate less popular or unfamiliar resources. The addition of this search bar would address both of these issues, increasing the convenience of using the website by adding an aspect of a traditional search engine and making it easier to locate information on new or unknown resources and topics. It is suggested that this search bar be maintained across all pages of the website, not just the homepage. At the moment, the library website search bar is only accessible from certain areas of the site. Its addition across all areas of the library website would further increase the usability and accessibility of all site features.



Figure 14. Displayed is an example of the proposed full site search bar included in the upper right-hand corner of the current library website.

### Recommendation 2: Add hover text to links.

In order to successfully navigate through the website, it is essential that users know which links lead to the correct content. While most of the link titles are simple and relatively clear, the test results demonstrate that less well-known features of the website are more difficult to locate, despite the relatively clear link titles. If a user does not know what My Library Account is used for, they may not choose to click this link, increasing the time necessary to locate the correct content and decreasing the level of convenience that these front page links provide. As the links do follow best practice guidelines in terms of creating a usable website, completely changing them seems unnecessary. Instead, it is proposed that hover text, viewable when mousing over a link, is added that provides more description and contextual information about the content that is made available through the hyperlink (Figure 15). This is intended to increase the usability and accessibility of the links themselves as well as their linked content.



Figure 15. Displayed is an example of the proposed addition of hover text as a curser is held over a tab on the library homepage.

Recommendation 3: Add an FAQ section addressing how to use certain website features.

When users, especially new users, are attempting to navigate through the various features included on this site, there are very likely going to be resources that they are

unfamiliar with and do not know how to use. Participants during the usability test encountered this issue on multiple occasions, mainly during task six of the first section in which they were instructed to go to the page where they could renew a loan online and task three of the second section where they had to navigate to the InterLibrary Loan program page and log in. Because both of these features were new to the users, the amount of time spent attempting to complete the tasks increased, and the successful completion rate was negatively impacted. A solution to this problem could be the creation of an FAQ page for students or other library website users (Figure 16). This section of the website could address the features of the site that new users are less likely to know, such as RAP sessions, My Library Account, and InterLibrary Loans. Questions about what these resources are and how to use them could be answered, and the more basic functions of the site could be addressed as well, including how to use the library catalog or find certain databases for research purposes.

This addition could allow users the opportunity to learn about the features that are unfamiliar to them rather than having them attempt to figure them out on their own as they did in the usability test. FAQs can increase the level of convenience of using these new features and also allow users to learn more about them whenever they are in need of them, rather than forcing them to wait until someone is available to explain the feature to them ("The power of...," 2020). While users do have the ability to contact a librarian or use the Ask a Question/Make a Comment feature, the amount of time it takes to receive an answer is unpredictable, decreasing the level of convenience of these resources. It is suggested that this feature be added to the Services page as well as the Find Services section of the homepage.





Figure 16. Displayed is an example of the proposed addition of an FAQ page linked to the homepage of the library website under the Find Services section.

### Moderate

### Recommendation 4: Reorganize the RC 1000 Research Guide.

Most of the participants found that the LibGuide was overall satisfactory in terms of content. However, the main feedback that was consistent across all of the interviews and post-survey materials was about the organization of the information on this page. While there is not a single correct way of completing a research project, all of the participants agreed that having the information contained within this guide organized into the main steps of completing a paper would make the guide more useful for its intended audience and cut down on the time students need to spend on finding the information they are looking for (Figure 17).

According to the participants, beginning with choosing a topic makes sense to the overall organization of this page. Participants then felt the logical next step would be to learn

about the library's research tools. This step originally followed the Sources: Categories and Types section. Participants thought that it would make more sense to switch these, instead having Library Research Tools immediately follow the Choosing a Topic section, with Sources: Categories and Types being combined with the Evaluating Your Sources section. Participants felt that having so many tabs with similar titles caused confusion when attempting to locate certain information. Combining these tabs is intended to increase the clarity of the side navigation pane and create less confusion for the users. Several participants indicated that they felt that citations were an integral part of the research process and thus should have its own section. Information on citations is currently contained within the Additional RC 1000 Resources tab, which led to increased task completion times for the final task of the second section as participants did not associate citations with this tab title. It was also suggested that a section on writing and formatting a research paper in MLA and APA format, including examples or templates, could be a useful addition to this page. This section could be situated after the Other Research Options section and before the previously suggested Citations section.

This way of organizing the guide seems to better represent the process and context of the students' mental model rather than that of a librarian or faculty member. The implementation of these small organizational changes can allow for a design that is focused more around the needs and preferences of the user, and in this case, that could mean exploring alternative methods of information organization, such as the stages of completing a research project (Sinkinson et al., 2012). To mitigate the issue of enforcing one mental model on all users, it can be noted in the RC 1000 Research Guide tab that the process of writing a paper is not linear and often changes from person to person.



Figure 17. Displayed is an example of the RC 1000 Research Guide with the side navigation reorganized as suggested by the participants.

### Recommendation 5: Add the email of staff and faculty members onto their contact pages.

While participants found it to be a simple task to find the pages of librarians that they could contact, when trying to obtain their email information, they were faced with an issue. Rather than having the email address of each librarian or staff member listed with their picture, office phone numbers, and office information, a link that reads "Email me" is listed. While this may be a convenient feature for certain users, this link tends to take student users to an Outlook page, which was both frustrating and inconvenient for the participants in this test. Users who are merely looking for this information and are not yet prepared to send an email, or who may be collecting several email addresses to use at once, may not want to be immediately redirected to send an email, especially if their email service provider is not Outlook. Rather than having only this link present on the contact pages, it is suggested that the actual email address be included either above, below, or to the side of this link (Figure 18). This will allow users to merely look at or copy the email address for later use.



Figure 18. Displayed is an example of the proposed addition of the full email address of library faculty and staff in their contact information.

### Recommendation 6: Add side navigation to the homepage.

Another popular comment by participants was in regard to the organization of the homepage. According to a study done on student mental models and research guides, undergraduate students often feel that library web pages "appear cluttered, overwhelming, and do not present a clear path where to begin" (Sinkinson et al., 2012). The homepage of a website should emphasize the top one to four tasks and have clear starting points for these so as to not overwhelm the user (Nielsen, 2022). Feedback about the layout of this page mainly mentioned that there seemed to be too much information in one place. Participants noted that much of the information on this page seemed repetitive and a bit overwhelming, and it would be easier to find the information that was relevant to their search had they been able to use a left side navigation pane along with drop down menus so that all of the other information on the page was not competing for their attention. Having the six main tabs that are at the top,

Research, Services, Visit, Give, About, and Contact, listed along one side with drop down menus that contain the links to the webpages with the various services, hours of operation, and research resources create a more streamlined experience for the user. Rather than sorting through all of the boxes of information on the homepage, clicking through links, and scrolling through pages, users would be able to search through the navigation pane to find what they are looking for, creating a more convenient experience. By applying this side navigation pane across all areas of the website, there will be more consistency in the design of each page, and users will be able to easily navigate to other areas of the site.

### Minor

### Recommendation 7: Clearly define a home button at the top of the webpage.

One of the more consistent observations made throughout each of the tests was regarding the path that participants chose to return to the main homepage. While one can merely click on the University Libraries header and be navigated back to the main library webpage, none of the participants were aware of this feature. Because this navigation feature is not made clear, participants instead repeatedly clicked the back button or even opened a new tab and entered the URL for the homepage. While this is not a major issue, making a subtle improvement in the usability of the interface such as the addition of a Home tab or home button can improve the user's experience navigating through the site and lead to less frustration overall (Figure 19). Little additions such as this can enhance the convenience of this kind of interface to some degree, slightly closing the gap between using this website versus using a popular search engine.



Figure 19. Displayed is an example of the proposed full site search bar included in the upper right-hand corner of the current library website.

Recommendation 8: Ensure that the location of items found through the Map it! feature is updated regularly to accommodate for shelve shifting.

While participants had no trouble using this feature during the test, through observations made while working as a Student Assistant in the library, it has become apparent that the Map it! feature has become outdated in certain areas of the library, mainly in Special Collections. When new materials are added to the open stacks collection, shifting must be done to accommodate the additional space needed on the shelves. With the shifting that has been done over the course of the last several semesters, the location of the materials on the shelves has changed drastically. This shift, and the lack of updates on the changed location of materials, has led to the Map it! feature being obsolete in this section of the library. While this feature can be used to enhance the convenience of using both the physical and digital library as well as increase the usability and accessibility of the catalog, having the incorrect location listed negates these positive aspects. Making regular updates to this feature will help combat this issue and increase the usability of this website feature.

### Conclusion

The objective of this UX test was to gain a better insight into how the newest students at Appalachian State interact with their online library resources and then use this information to create applicable solutions that would allow this user interface to better serve the needs of the target user base. Library websites have become a core resource in the contemporary world of library services, both public and academic. They serve as a support system for students and faculty alike, assisting in curriculum development and research activities, acting as an access point for credible and relevant resources, and communicating how to locate the information that one is searching for (Letnikova, 2008). In an increasingly digital world, it is imperative that library websites be a central area of concentration for public and university libraries. While this site has been designed with the intent to serve the users, it is still an example of how important it is to continually work to identify the current mental model of the target user group and apply the principles of design thinking to ensure that the needs of this group are being met. The issue with websites is that they don't tend to age well and benefit from regular update cycles (Eaton & Arguelles, 2019). While librarians place a high value on information accessibility, this does not mean that their idea of a good user experience coincides with that of the intended users. The results of this thesis demonstrate that, while this website has an overall usable and navigable design, the target users often prioritize convenience and efficiency over all else. The users are highly discriminating about how they spend their time and are focused on getting the answers they need as soon as they need them. Because of this, implementing small changes that increase the level of convenience of using this site, creating an experience similar to that of using a popular search engine, can help to better fulfill the needs of these users, which can hopefully lead to more

students choosing to use the many incredible resources that are available to them through this interface.

The convenience of using the University Libraries website and the RC 1000 LibGuide can be improved through the application of some of the above recommendations, which would serve to help increase the navigability and accessibility while decreasing the amount of time necessary to use many of the more popular resources. The analysis from both sections of the test indicates that, while this site does apply many of the guidelines of good website design, there are still some changes that could be made to more closely align with the mental model of the users. The experience that these users have with this website is impacted significantly by how it compares with the convenience of using one of the many well-known and efficient search engines. Making the homepage more streamlined, reorganizing the content on the LibGuide, and adding a resource for learning about specific features and how to use them can all have drastic impacts on the website's functionality and usability. The website's many library and research specific features, such as the databases, online catalogs, chat functions, subject guides, and many other freely available resources, make it an excellent tool for students who are seeking a higher education. In order to make their educational experience at Appalachian as supportive and valuable as possible, it is important to acknowledge that the usability of such a significant resource can always be improved upon, and the needs of the students must always be prioritized and met on an organizational level.

# Appendix A

This appendix contains the additional data collected from students who filled out the initial recruitment survey but chose not to participate in the actual study itself. All names and personally identifiable information have been excluded. Also contained in this appendix are the participant consent forms signed by the four participants who completed the full study.

Year in School	Major	Minor	Enrolled in RC 1000	Course Delivery Format	Learning Style	Familiarity with the library website (1-5 scale)
First Year	Business Management	N/A	Yes	Online, Asynchronous	Kinesthetic	1
First Year	Business Administration	N/A	Yes	Online, Asynchronous	Visual	2
First Year	Nursing	N/A	Yes	Online, Asynchronous	Visual	3
First Year	Exercise Science	N/A	Yes	Online, Asynchronous	Visual	1
First Year	Nursing	N/A	Yes	Online, Asynchronous	Visual	1
Second Year	Public Health	N/A	Yes	Yes Online, Asynchronous		2
First Year	Theater Education	Psychology	Yes	Online, Asynchronous	Visual	1
Second Year	Biology	Animal Science	Yes	Online, Asynchronous	Visual	3
First Year	Criminology	N/A	Yes	Online, Asynchronous	I don't know	2
First Year	International Business	N/A	Yes	Online, Asynchronous	Visual	2

Item A1. Additional demographic data from the initial participant recruitment form.

First Year	Undecided	N/A	Yes	Online, Asynchronous	Visual	3
First Year	Music Industry Studies	N/A	Yes	Online, Asynchronous	Visual	1
First Year	Interior Design	N/A	Yes	Online, Asynchronous	Visual & Kinesthetic	2

Item A2. Participant 1 consent form.



Item A3. Participant 2 consent form.



Item A4. Participant 3 consent form.

alac Information to Consider about this Research Researching Resources: A Usability Test of Appalachian State's Library Website and the RC 1000 **Research Guide** Principal Investigator: Ella Riddick Department: English Contact Information: riddickem@appstate.edu Or Dr. Savannah Paige Murray at murrays@appstate.edu You are invited to participate in a research study about Appalachian State's library website and the RC 1000 Research Guide. The study will be evaluating the usability of the library's online user interfaces through the observation of real users as they complete a set of realistic tasks. If you agree to be part of the research study, you will be asked to complete a pre and post test survey as well as a short usability test of Appalachian State's library website. Participating in this study is completely voluntary. Even if you decide to participate now, you may change your mind and stop at any time. You may choose not to complete any task, answer any survey question, or respond to any interview question for any reason. If you have questions about this research study, you may contact Ella Riddick at riddickem@appstate.edu or Dr. Savannah Paige Murray at murrays@appstate.edu. The Appalachian State University Institutional Review Board (IRB) has determined that this study is exempt from IRB oversight. By continuing to the research procedures, I acknowledge that I am at least 18 years old, have read the above information, and agree to participate. I agree to participate in the study. 09/29/2022 Signature

Item A5. Participant 4 consent form.



## **Appendix B**

Contained within this appendix is the initial participant recruitment survey questions, the list of questions from the pre-test survey, the official pre-test script read to each participant prior to the beginning of their testing session, the task lists from sections I and II, the list of the post-session interview questions, and the list of questions from both post-test surveys.

Item B1. Initial participant recruitment survey questions.

# **Initial Participant Recruitment Survey - Questions**

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- 1. Name
- 2. Preferred Name (optional)
- 3. Preferred Pronouns
- 4. Race
- 5. First Language
- 6. School Email Address (@appstate.edu)
- 7. Current Age (in years)
- 8. Year in School (please select the option that reflects how many years you have been attending Appalachian State rather than your year according to credit hours earned)
- 9. Major/Intended Major
- 10. Minor/Intended Minor (if applicable)
- 11. Are you currently enrolled in UCO 1200 this semester?

- 12. Are you currently enrolled in RC 1000 this semester?
- 13. If your answer to the previous question was yes, what course delivery format is your RC 1000 class in?
- 14. Preferred Learning Style

15. Have you had any experience using Appalachian State's library website? Please use this scale for reference when answering: 1 - I have never used the library website; 2 - I have been on the library website before but have not used it for school work yet; 3 - I have used the resources on the library website once or twice; 4 - I am familiar with how to use the library website; 5 - I am very familiar with how to use the library website; 5 - I am very familiar with how to use the library website.

Item B2. Pre-test survey questions.

## **Pre-Test Survey - Questions**

- 1. Name
- 2. How familiar are you with how to use computers and navigate websites?
- 3. At this moment, how would you describe your relationship with Appalachian State's library website?
- 4. Please select all of the online library resources that you have heard of
- 5. Please select all of the online library resources that you have personally used
- 6. Are you aware of library subject guides (also referred to as LibGuides)?
- 7. Have you ever done an academic research project or paper?

- 8. If your answer to the previous question was yes, what resources did you use to research your topic?
- 9. What aspect of research projects do you find the most difficult?
- 10. Why is this the most difficult aspect of research projects?

Item B3. Official pre-test script.

## **Official Pre-Test Script**

Moderator: Thank you for your willingness to participate in this study today. My name is Ella, and I will be your test moderator. Before we begin your session, I will be reading from this script so that all participants are able to receive the same information about the test. This will be usability testing session [#] on [date] at [time] with participant P[#]. Please be aware that I will not be able to answer questions about how to complete each activity during the testing process. There will be no penalty for being unable to complete the task as directed. If you ever experience any confusion or difficulty understanding the way something on the library website works or is written, please make me aware of this issue. The point of this activity is to discover how we may make the library website more accessible and usable for students, so any comments or concerns regarding the content on the library website is more than welcome.

### Pause for questions.

First, please read through the participant consent form and sign it to indicate that you are willing to participate in this test.

Allow time for participants to read over the form and sign indicating their willingness to take part in the study.

Now we can go over the basic procedures for this session. For this UX test, you will be asked to complete fifteen short activities. Again, I want to make it clear that there is no right or wrong way to complete these activities. If you are uncomfortable or cannot complete the task, let me know, and we can either move on to the next activity or stop the session altogether. We will have an hour in total to complete the usability test, but you are not obligated to finish all of the tasks in the set time provided. You are encouraged to take as much time as you need to complete each activity.

Making verbal comments or thinking out loud during the test is both acceptable and encouraged. If you are confused, if you don't like the design, if you feel frustrated or stuck, or if you just want to speak your mind, please feel free to make this known. This verbal feedback is additional data.

If at any point you need to take a restroom or water break, please inform me, and the test will be paused.

Are you ready to begin? –

### End Script.

Item B4. Section I: Homepage Task list.

# UX Test - Task List

Please complete the following activities to the best of your ability. There is no right or wrong way to complete these tasks. If you are unable to complete the activity, please inform the moderator. Feel free to write any comments, concerns, or questions regarding the tasks, the library website, the RC 1000 LibGuide, or any other areas you may have thoughts on in the space provided. Making verbal comments is also acceptable and encouraged. Thank you for your participation.

### Homepage Tasks

This first set of activities will focus on tasks which must be completed using the library homepage. These tasks are designed to determine the navigability of the website's main page and how easily students are able to use the various resources provided to them through this interface. The resources are offered freely to students and can be utilized throughout your academic career. Though no questions about these resources can be answered during the test itself, please feel free to ask any questions about what these resources are and how to use them after the session has been completed.

- 1. You have logged onto one of App State's desktop computers and have selected a browser. This has taken you to Appalachian State's main webpage. Please navigate to the Library's homepage from this screen.
- 2. You would like to check out a hard copy of a book tomorrow, but you're not sure what the library's hours are. Find out what time the main service desk in the library opens and closes tomorrow.
- 3. You want to contact a librarian for help with finding resources for a project. Find the contact information of one of the University librarians.
- 4. You have a big test coming up in your math course, and your roommate likes to have people over at all hours. You need a quiet place to study. Use the library website to book a group study room.

- 5. The due date is coming up for your final research project for your sociology course, and you don't know where to start with researching your topic. Make an in-person research advisory appointment (request a RAP session) with the librarian who will be most suited for your topic.
- 6. You checked out a book last month, and the due date is approaching. With all your homework, you haven't had time to finish the book. Find the page that allows you to renew the loan online with your Appstate account
- 7. Your professor has requested that you read the common reading book for the year, *Junaluska: Oral Histories of a Black Appalachian Community.* You don't have time to go to the library to pick up a physical copy. Use the library catalog to find what other formats the book is available in.
- 8. You have been asked to read William Faulkner's *The Sound and the Fury* for your American Literature class. Use the advanced search feature to find a physical copy of this book in the library. Sort your search by relevance. Stay on this page after you have found it.
- 9. Use the "Map It!" feature to find the location (floor) of The Sound and the Fury.

Item B5. Section II: LibGuide Task list.

### LibGuide Tasks

This second set of tasks will focus on the usability of the RC 1000 Research Guide. This subject guide is meant to support RC 1000 students in research assignments and serves as a companion resource for those available via the library website's homepage. Please use the various pages/tabs on this guide to complete the following tasks. If you become confused or come to a point where you would typically use an outside search engine to complete the task, please indicate this to the moderator.

- 1. You have been asked to complete a research paper for your RC 1000 course. Your professor has indicated that you use the RC 1000 LibGuide to guide you in your research. Navigate to the library guide titled "RC 1000 Research Guide."
- 2. You want to get a head start on your research, but you are having a hard time settling on a topic. Explore the resources on the RC 1000 Research Guide about how to choose your topic.
- 3. You have found a book that you want to use in your research, but it is only available through the library at UNC Asheville. Use the RC 1000 Research Guide to figure out how to use the interlibrary loan program. When you have found the information on the RC 1000 LibGuide, please navigate to the service that allows you to request an interlibrary loan.
- For your research project, you were asked to only use primary and secondary sources. Use the RC 1000 Research Guide to determine what sources are considered primary and secondary. Either write out or vocally list a few examples of each.

- 5. You have been asked to use an article for your research paper as well. Use the RC 1000 LibGuide to learn how to use the APPsearch feature on the library website. After you have explored this resource, use the APPsearch feature to find an article on a topic that interests you or that is specific to your major.
- 6. After writing the research paper, your professor has asked you to include a works cited page in MLA format. Please use the RC 1000 Research Guide to help you create an MLA citation of the article that you chose in the previous activity. You may use a google doc, a word doc, or this paper and a pencil to write the citation.

Item B6. Post-session interview questions.

### **Post-Session Interview - Questions**

\_

- 1. How would you describe your overall experience using the library website?
- 2. What areas of the website did you find the most helpful or easy to use?
- 3. Which sections did you like the least?
- 4. What, if anything, surprised you about your experience with this site?
- 5. What, if anything, caused you to feel frustrated?
- 6. What is your typical first step when completing a research project?
- 7. Do you feel that the library website is something that you as a student should be using for your research? If not, what other avenues do you think are appropriate for students to use?
- 8. Why do you think many students tend to gravitate towards using search engines like Google or Bing?

- 9. Do you feel that using the library website takes up more time than necessary?
- 10. How many web pages are you usually willing to click through to find what you are looking for on one site?
- 11. Are there any changes that would make the library website more appealing to you or to other students?
- 12. Do you think that students could benefit from using subject guides like the one you had to use in this test?
- 13. Did the design of this guide coincide with how you typically do research?
- 14. What aspects of the LibGuide did you find useful? What made them feel more useful?
- 15. Were there any features that you found unappealing or confusing?
- 16. What is the most difficult part of completing a research project and why?

Post Test Survey Section I: Homepage Tasks							
Please answer the survey questions honestly and to the best of your ability.							
riddickem@appstate.edu (not shared) Switch account * Required							
Name * Your answer							
<ul> <li>Overall, did you find the instructions for this testing session to be easy to follow? *</li> <li>They were very difficult to follow</li> <li>They were somewhat difficult to follow</li> <li>They were relatively easy follow</li> <li>They were easy to follow</li> </ul>							
Overall, how difficult was it to complete the homepage tasks using the library website       *         Very difficult       Somewhat difficult         Neither easy nor difficult       Somewhat easy         Very easy       Very easy							

Which tasks from the homepage task section took you the most time? (check all * the apply									
Task 1									
Task 2									
Task 3									
Task 4									
Task 5									
Task 6									
Task 7									
Task 8									
Task 9									
On a scale of 1-10 (Did you find the s	0, how information of the steps to constant of the steps to constant of the steps to constant of the steps to c	uitive dic complete 3 4	each t each t 5	nd the ask to 6	o be s	ign of self e: 8	f the xplan 9	atory) 10	website? *
Do you feel that the library website is easy to navigate? *									
O Very difficult									
O Somewhat difficult									
O Moderate									
O Somewhat easy									
O Very easy									
<u> </u>									

	*
likely to use in the future?	ost
APPsearch	
Interlibrary loan	
RAP sesssions	
Group Study room reservations	
Online Library Catalog	
Academic Databases	
My Library Account	
Chat Assistance	
Library Guides	
Map it!	
used if not for this test?	
I would use most of if not all of these resources at some point	
O I would use some of the resources but not all	
I would not use most of these resources	
O I would not use any of these resources	
O Other:	
Do you think that students would benefit from a guide on what resources the	*
Do you think that students would benefit from a guide on what resources the library has and how to use them?	*
Do you think that students would benefit from a guide on what resources the library has and how to use them?	*
Do you think that students would benefit from a guide on what resources the library has and how to use them? Yes No	*

Do you feel that knowing how to use the resources on the library website will help $*$	
you personally in your major?	

O Not at all useful



- O Moderately useful
- Very useful

How easy was it to navigate to the library home page from the main university \* website?

- Very difficult
- Somewhat difficult
- ) Moderate
- Somewhat easy
- O Very easy

How easy was it to find the hours for the library service desk? \*

- Very difficult
- O Somewhat difficult
- Moderate
- Somewhat easy
- Very easy
Did you find it hard to find the contact information for the current librarians? \*

It was very difficult

It was somewhat difficult

It was moderately easy

- It was somewhat easy
- It was very easy

If you found it difficult to find the contact information, why? \*

Ο	I did	not	find	it	difficult
---	-------	-----	------	----	-----------

Other:

How easy was it for you to book a group study room? \*

|--|

- Somewhat difficult
- ) Moderate
- Somewhat easy
- ◯ Very easy

Did you find the process of reserving a room easy or confusing? *	
O It was very confusing	
O It was somewhat confusing	
O It was not confusing	
O It was easy	
O It was very easy	
O Other:	
If you found booking a room to be confusing, why?	
O I did not find it confusing	
O Other:	
How was your experience making a RAP appointment? *	
O It was difficult to make the appointment	
O It was somewhat difficult to make the appointment	
O It was relatively easy to make the appointment	
O It was very easy to make the appointment	
Are you likely to use RAP session appointments for future research projects? *	
O Definitely not	
O Probably not	
O Maybe	
O Probably yes	
O Definitely yes	

How easy was it to use your library account to look at your current loan status? * <ul> <li>Very difficult</li> <li>Somewhat difficult</li> <li>Moderate</li> <li>Somewhat easy</li> </ul>
O Very easy
Are you more likely to renew your loans online or in person?
O In person
O neither
O both
O Other:
How easy was it to find a book using the online library catalog? *
O Very difficult
O Somewhat difficult
O Moderate
O Somewhat easy
O Very easy
If you found using the catalog difficult, why? *
O Other:

How easy was it to use the advanced search feature? *
O Very difficult
O Somewhat difficult
O Moderate
O Somewhat easy
O Very easy
If you found the advanced search feature difficult to use, why?
I did not find it difficult to use
O Other:
Did you find the Map it! feature to be easy to understand? *
O Not at all
O Somewhat
O Easy
O Very easy
Would you use the Map it! feature to locate a book in the library? *
Yes, I would use the Map it! feature and find the book by myself
$\bigcirc\ $ Yes, I would use the Map it! feature but have a library staff member show me where the book is
$\bigcirc$ No, I would not use the Map it! feature. I would just ask the library staff to find it for me.
No, I would not use the Map it! feature. I would not check out physical books or other materials from the library
O Other:

Did you find any of the links/their labels to be confusing? *    Yes   No   Other:
If you answered "yes" to the previous question, why O Too many words Not enough words Title did not accurately describe the linked content The color/font made it difficult to read The title was difficult to understand O ther:
<ul> <li>What would improve the navigability of the library catalog? *</li> <li>Clearer/more descriptive links</li> <li>More sorting features (sort from oldest to newest publications, sort from A-Z or Z-A by title, sort by author last name, etc.)</li> <li>More information listed in the description</li> <li>Less information listed in the description</li> <li>Other:</li> </ul>

Which resources do you feel would be most useful for you or your classmates? $^{\star}$
Map it!
Chat Assistance
My Library Account
Group Study room reservations
RAP sessions
Academic Databases
How would you describe your current ability to use the library website? * 1 2 3 4 5 Very unfamiliar O O O O Very familiar
On a scale of 1-10, how would you describe your level of satisfaction with the current library website?
1 2 3 4 5 6 7 8 9 10
Very dissatisfied $\bigcirc$
If you could change one thing about the library website, what would you change * and why? Your answer

Please use this section to make comments on any of the tasks or res	sources.
Your answer	
Submit	Clear form

Post Test Survey Section II - LibGuide Tasks Please answer these questions honestly and to the best of your ability.	
riddickem@appstate.edu (not shared) Switch account * Required	Ø
Name * Your answer	
Overall, how difficult was it to complete the LibGuide Tasks? * <ul> <li>Very difficult</li> <li>Somewhat difficult</li> <li>Neither easy nor difficult</li> <li>Somewhat easy</li> <li>Very easy</li> </ul>	
Please rank the LibGuide tasks from lease to most difficult. * Your answer	
Why were the higher ranking tasks more difficult? * Your answer	

) No

A little bit

Moderately

O Yes

Very time consuming

Which tasks from the LibGuides section took you the most time (check all that \* apply)

Task 1

Task 2

] Task 3

] Task 4

Task 5

Task 6

How clearly was the information presented in the RC 1000 Research Guide? \*

Ο	Very	unclear
---	------	---------

O Somewhat unclear

O Neutral

O Somewhat clear

Very clear

Did you find the information in the RC 1000 LibGuide to be helpful in completing * the tasks?
○ Yes
O No
O Kind of
O Other:
Why or why not? *
Your answer
Do you feel that the current RC 1000 Research Guide is useful? *
⊖ Yes
O No
O Kind of
O Other:
What would make this guide more useful to you? *
Your answer
What features would make you more interested in using this or another subject * guide/LibGuide?
Your answer

Why do you think students may not want to use the LibGuides? *
O They would rather just use search engines like Google
O The LibGuides are difficult to find
O The information is not useful or relevant
O The content is difficult to understand
O Other:
Do you think having more specific names for LibGuides, such as "Beginning Your * Research" or "Researching? Start Here" would make LibGuides easier to find for students?
O Probably not
O Maybe
O Probably
O Very likely
Do you think you or other students would be more likely to use LibGuides if they * were linked directly on the main library web page?
O No
O Probably not
O Maybe
O Probably
O Very likely

If your instructors linked Subject guides for your specific courses on AsULearn, * would you be more likely to use them? No Probably not Naybe Probably Very likely
Do you prefer interactive content or static/text instructions? *
<ul> <li>neither</li> </ul>
O Other:
What interactive content helps you to learn? *
Games
Quizzes
Graphs
Infographics
Interactive models
Videos
Forums
Modules
Other:

<ul> <li>Did you watch the videos on the LibGuide to complete the tasks? *</li> <li>Yes</li> <li>No</li> <li>Partially</li> </ul>
Why or why not? * Your answer
If there is an instructional video, how much time are you willing to spend watching <b>*</b> it?
O - 1 minutes
O 1 - 2 minutes
O 2 - 4 minutes
O 4 - 6 minutes
O 6 - 8 minutes
O 8 - 10 minutes
O 10+ minutes
O 0ther:
Did you feel that the information on choosing your topic was helpful? *
⊖ Yes
O No
O Kind of
O Other:

If you were struggling to choose a topic and begin your research, how would the	*
information on this page make you feel about beginning the research process?	

0	Very unconfident
0	Less confident
0	Unaffected
0	More confident
0	Very confident
0	Other:

After looking at this page, what are you most likely to do first when deciding on a \* research topic?

- O Use a search engine like Google to find a topic
- Talk to a classmate
- Talk to a professor
- O Discuss the project with a librarian
- O Go to the University Writing Center
- Create a concept map
- O Brainstorm by free writing on your topic
- Other:

Was it easy to navigate to the RC 1000 Research Guide? *
O No, it was very difficult
O No, it was somewhat difficult
O It was neither easy nor difficult
O Yes, it was somewhat easy
Yes, it was very easy
If you found it difficult to find the RC 1000 Research Guide, why?
Your answer
Did you find the resources (videos, links, etc.) on choosing your topic to be * useful?
◯ Yes
<ul> <li>Yes</li> <li>No</li> </ul>
<ul> <li>Yes</li> <li>No</li> <li>Kind of</li> </ul>
<ul> <li>Yes</li> <li>No</li> <li>Kind of</li> </ul>
<ul> <li>Yes</li> <li>No</li> <li>Kind of</li> </ul> Why or why not? *
<ul> <li>Yes</li> <li>No</li> <li>Kind of</li> </ul> Why or why not? * Your answer

Were the directions on how to use the interlibrary loan service clear? *	
O Very unclear	
O Somewhat unclear	
O Moderately clear	
O Fairly clear	
O Very clear	
O 0ther:	
Did these instructions on how to use the interlibrary loan program help you to complete the task?	*
O Not at all	
O Somewhat	
O Moderately	
O Yes	
O Very much	
Did you find the information about primary, secondary, and tertiary sources to be clear?	*
O Very unclear	
O Somewhat unclear	
O Moderately clear	
O Fairly clear	
O Very clear	

primary, seconda	iry, and	d tert	iary s	sourc	e?	inang	g of t	he di	fferei	nces b	oetween a	*
O Not at all												
O Somewhat												
O Moderatly												
O Yes												
O Very much												
helpful?          Not at all         Somewhat         Moderately         Yes												
<ul> <li>Very much</li> <li>On a scale of 1-10 format citations?</li> <li>Very confusing</li> </ul>	0, how 7 (1 = v 1	r wol ery c 2	ild yo confu 3	ou rate sing, 4	e the 10 = 5	instr very 6	uctio helpf 7	nal m jul) 8	9	als or 10 ()	n how to Very hel	* pful
<ul> <li>Very much</li> <li>On a scale of 1-10 format citations?</li> <li>Very confusing</li> <li>On a scale of 1-10 LibGuide?</li> </ul>	0, how (1 = v 1 () 0, how	r wou ery c 2 O	uld yc confu 3 O	ou rate sing, 4 O	e the 10 = 5 O	instr very 6 O	uctio helpf 7 O	nal m iul) 8 O	9 O	als or 10 〇	n how to Very hel	* pful *
<ul> <li>Very much</li> <li>On a scale of 1-10 format citations?</li> <li>Very confusing</li> <li>On a scale of 1-10 LibGuide?</li> </ul>	0, how (1 = v 1 (), how	r wou ery c 2 () r wou 2	Ild yc confu 3 O Ild yc 3	ou rate sing, 4 O ou rate 4	e the 10 = 5 () e you	instr very 6 0 r leve	uctio helpf 7 O el of s	nal m ul) satisf	9 O Factio	als or 10 O n with	n how to Very hel	* pful *

If you could	add a feature/resource to this LibGuide, what would you add? *	
Your answer		
lf you could change?	change one of the elements of this LibGuide, what would you	لا
Your answer		
Please use t	his section to make comments on any of the tasks and resource	s.
Your answer		

## Appendix C

Contained within this appendix is an infographic on how usability testing can be used to promote accessibility within higher education.

## Item C1. UX Infographic



## References

- 7 best practices for creating a user friendly library website (2015, December 8). EBSCO Information Services, Inc. | www.ebsco.com. https://www.ebsco.com/blogs/ebscopost/7-best-practices-creatinguser-friendly-library-website
- Accessibility. (n.d.) Interaction Design Foundation. https://www.interactiondesign.org/literature/topics/accessibility
- Accessibility, usability, and inclusion. (n.d.). Web Accessibility Initiative (WAI). https://www.w3.org/WAI/fundamentals/accessibility-usability-inclusion/
- Acharya, K.R. (2018, August). "Usability for User Empowerment: Promoting Social Justice and Human Rights through Localized UX Design." *Proceedings of the 36th ACM International Conference on the Design of Communication.*
- Babich, N. (2020, November 24). *Web Page Design: A Comprehensive Guide*. Adobe XD Ideas. https://xd.adobe.com/ideas/principles/web-design/web-page-design/
- Babich, N. (2021, January 21). User & Usability Testing Questions: Ultimate guide: Adobe XD ideas. Adobe XD Ideas. https://xd.adobe.com/ideas/process/user-testing/usability-testing-questions-tips-examples/
- de Bianchi, M. (2018). "Observer effect". In B. Frey (Ed.), The SAGE encyclopedia of educational research, measurement, and evaluation (pp. 1172-1174). SAGE Publications, Inc., https://dx.doi.org/10.4135/9781506326139.n484
- Bouchey B. Gratz E. & Kurland S. (2021). *Remote student support during covid-19: perspectives of chief online officers in higher education*. Online Learning 28–40.
- Centers for Disease Control and Prevention. (2022, October 28). *Disability impacts all of us infographic*. Centers for Disease Control and Prevention. https://www.cdc.gov/ncbddd/disabilityandhealth/infographic-disability-impacts-all.html
- Chang, M., French, A., & Web Strategies Committee. (2006, January). *Test Script Library Web Site Usability Test Spring 2006*. NC State University Libraries. https://www.lib.ncsu.edu/documents/dli/projects/redesignusability/Script.doc
- Currivan, D. (2008). Conversational interviewing. In P. J. Lavrakas (Ed.), Encyclopedia of survey research methods (pp. 152-152). Sage Publications, Inc., https://dx.doi.org/10.4135/9781412963947.n107

- Dam, R. F. & Siang, T. Y. (2022). *What is Design Thinking and Why is It So Popular?* Interaction Design Foundation. https://www.interactiondesign.org/literature/article/what-is-design-thinking-and-why-is-it-so-popular
- Davis, P. (2019, January 6). *Applied empathy: The unique value of technical writers and User Advocacy*. TechWhirl. Retrieved August 2022, from https://techwhirl.com/applied-empathy-unique-value-technical-writers-useradvocacy/
- Defining Technical Communication. (n.d.) Society for Technical Communication. https://www.stc.org/about-stc/defining-technical-communication/
- Dumas, J. S. and J. C. Redish. 1993. *A practical guide to usability testing*. Norwood, NJ: Ablex.
- Eaton M. & Argüelles Carlos. (n.d.). "Usability study for a community college library website: a methodology for large-scale data gathering." Community & Junior College Libraries 99–113. https://doi.org/10.1080/02763915.2019.1645552
- Haas A. M. & Eble M. F. (2018). "Key theoretical frameworks : teaching technical communication in the twenty-first century." Utah State University Press. Retrieved August 2022 from https://search.ebscohost.com/login.aspx?direct=true&scope=site&db=nlebk&db=nlab k&AN=1931101.
- Individual Interviews. (n.d.). Usability.gov. https://www.usability.gov/how-to-and-tools/methods/individual-interviews.html
- Jones N. N. (2016). "The technical communicator as advocate : integrating a social justice approach in technical communication." Journal of Technical Writing and Communication 342–361. https://doi.org/10.1177/0047281616639472
- Katunzi, S. (2022, March 7). *Moderated versus unmoderated usability testing*. UXmatters. https://www.uxmatters.com/mt/archives/2022/03/moderated-versus-unmoderatedusability-testing.php
- Kimball, M. A. (2017). "The Golden Age of Technical Communication." Journal of Technical Writing and Communication, 47(3), 330–358. https://doi.org/10.1177/0047281616641927
- King, H. J. and C. M. Jannik, 2005. Redesigning for usability: Information architecture and usability testing for Georgia Tech library's web site. OCLC Systems & Services 21(3):235-243.

- LibGuide design: Best practices and guidelines: Editorial guidelines. WSU Libraries. (2022, May 18). Retrieved October 2022, from https://libguides.libraries.wsu.edu/bestpractices/editorial#s-lg-box-18759925
- McClain, C., Vogels, E. A., Perrin, A., Sechopoulos, S., & Rainie, L. (2022, April 28). *The internet and the pandemic. Pew Research Center: Internet, Science & Tech.* https://www.pewresearch.org/internet/2021/09/01/the-internet-and-the-pandemic/
- McCloskey, M. (2014, January 12). *Task scenarios for usability testing*. Nielsen Norman Group. https://www.nngroup.com/articles/task-scenarios-usability-testing/
- Moran, K. (2019, December 1). Usability testing 101. Nielsen Norman Group. Retrieved from https://www.nngroup.com/articles/usability-testing-101/
- Mortensen, D. H. (2020). *The basics of recruiting participants for User Research*. The Interaction Design Foundation. https://www.interaction-design.org/literature/article/the-basics-of-recruiting-users-for-usability-testing
- Nielsen, J. (2000, March 18). *Why you only need to test with 5 users*. Nielsen Norman Group. https://www.nngroup.com/articles/why-you-only-need-to-test-with-5-users/
- Pope-Ruark R. Tham J. Moses J. & Conner T. (2019). "Design Thinking in Technical and Professional Communication: Four Perspectives." Journal of Business and Technical Communication 437–455. https://doi.org/10.1177/1050651919854094
- The power of the FAQ page: Should your site have one? (2020, April 7). Trajectory. https://www.trajectorywebdesign.com/blog/should-my-website-have-a-faqpage/#:~:text=Adding%20a%20FAQ%20page%20can,to%20be%20available%2024 %2F7
- Reeb, B., & Gibbons, S.L. (2004). Students, Librarians, and Subject Guides: Improving a Poor Rate of Return. portal: Libraries and the Academy 4(1), 123-130. doi:10.1353/pla.2004.0020.
- *Running a Usability Test.* (n.d.) Usability.gov. https://www.usability.gov/how-to-and-tools/methods/running-usability-tests.html
- Sauro, J. (2013, July 30). *Rating the severity of usability problems*. Measuring U. https://measuringu.com/rating-severity/
- Sinkinson, C., Alexander, S., Hicks, A., & Kahn, M. (2012). Guiding Design: Exposing Librarian and Student Mental Models of Research Guides. portal: Libraries and the Academy 12(1), 63-84. doi:10.1353/pla.2012.0008.
- Usability (n.d.) Interaction Design Foundation. https://www.interactiondesign.org/literature/topics/usability

- Usability Testing. (n.d.) Interaction Design Foundation. https://www.interactiondesign.org/literature/topics/usability-testing
- Unrien, S. (2019, April). *What makes a good library website?*. ischool.syr.edu. https://ischool.syr.edu/wpcontent/uploads/2020/06/2019 What Makes a Good Library Website.pdf
- What is a LibGuide? (n.d.) LibGuides @ Pitt A Faculty Resource. https://pitt.libguides.com/faculty#:~:text=LibGuides%20are%20a%20content%20ma nagement,field%2C%20class%2C%20or%20assignment.
- Whybrow, L. (2015, May 21). Using C.R.A.P web design for eLearning. eLearning Industry. https://elearningindustry.com/using-crap-web-design-forelearning#:~:text=C.R.A.P%20stands%20for%20contrast%2C%20repetition,all%20t he%20time%20 for%20 websites