I. Research Proposal Cover Page

Title of Proposed Research

Assessment of User Experience with USF Library's Website Chatbot

Abstract

As chatbot technologies have developed and more programs are released for public use, students may become more inclined to utilize these technologies when completing academic assignments. While there is a risk that technologies like ChatGPT can be used to violate academic integrity, there is also great potential for these technologies to be used in conjunction with library resources to help students with their assignments. Previous literature has primarily focused on assessing the pros and cons of chatbot technology, though there is a lack of research into how this technology has influenced students' usage of the library and its materials. By surveying students on their use of ChatGPT and the library, we can analyze how chatbot technology impacts student engagement with the library.

Project Start Date	**Project Completion Date**
March 4th, 2024	January 5th, 2026
Amount Requested	**Proposal Submission Date**
$3,018	July 10th, 2023

Principal Investigators' Names & Affiliations**

Lauren Geller, Librarian, USF Tampa Campus

Amanda Gates, Librarian, USF Tampa Campus

Malachy Fitzpatrick, Librarian, USF Tampa Campus

Elias Royal, Librarian, USF Tampa Campus

Needs Assessment:

In our increasingly digital world, libraries and librarians are tasked with adopting new technologies to better serve their communities. AI technology has quickly taken users by storm and there has been debate over the implementation of chatbot technology in academic settings. Previous study suggests that chatbot technology, while limited in its capabilities, can enhance the experience of library users and draw focus to other library resources and services. Chatbot technology offers an opportunity for students to further engage themselves in libraries by providing interactive learning opportunities and reference assistance. Engagement with the library is what causes the library to grow, and continued assessment of user experience is necessary to determine how libraries adapt to suit their patrons. This project aims to investigate whether the implementation of chatbot technology on the USF Library's website affects students' engagement with the library as well as its impact on user satisfaction.

Literature Review:

Although chatbot technology is still relatively new, researchers have published studies on the implementation of chatbot technologies and their advantages and disadvantages in academic libraries. Research on the topic is becoming increasingly popular, showing that interest in chatbot technology is steadily rising.

One major benefit of the implementation of chatbot technology within the library is accessibility. Because a chatbot uses natural language processing, interacting with the chatbot is conversational and approachable to students who may not be familiar with utilizing library services and resources. Mckie and Narayan (2019) and Nawaz and Saldeen (2020) agree that the casual and conversational model of the chatbot interface can help reduce library anxiety in undergraduate students beginning research. Chatbot technology can also be an easy jumping-off point; rather than navigating the library's website, simple operational and directional questions can be answered

immediately by the AI. One of the most often-cited advantages of AI implementation in libraries is the triaging of routine questions. Chatbot technology can assist library staff by fielding simple questions and can increase user satisfaction in a budget-friendly way by providing reference assistance during non-staffed hours. Additionally, as Rodriguez and Mune (2022) discuss, the Covid-19 pandemic has shown us that having more virtual options for library access could be a good thing. Although a global pandemic or local weather phenomenon could certainly prevent in-person access to the library, adopting new forms of virtual assistance can also help distance learners, and expand access to non-residential students.

Papini (2023) evaluates ChatGPT based on the Association of College & Research Libraries, ACRL, Framework. The six information literacy instruction guidelines Papini analyzes are: research as inquiry, scholarship as conversation, searching as strategic exploration, authority is constructed and contextual, information creation as a process, and information has value. Papini found that ChatGPT helps assist and provide general information for students beginning their research, as it is a noncredible source of information that provides ambiguous and outdated information, as the program's "knowledge" ends in 2021. However, it can help find keywords and different ideological perspectives when one begins the research process.

While chatbot technology can imitate human-like interactions, the goal is not to replace human interactions but to enhance them instead (Vincze, 2017). That said, although AI can be effective at providing answers to rudimentary questions based on a script, it is not without its limitations. Vincze (2017) and Kane (2019) acknowledge that the upkeep of a chatbot can place a large burden on the library and/or development staff, which may eventually prove to be unsustainable. Ehrenpreis & Delooper (2022), too, assert that "regular maintenance and review of chatbot intents is essential to ensuring its success." AI chatbots are limited both by the people who develop their software and by the research skills of the user (Mckie & Narayan, 2019). As users

increase their research abilities, they may quickly outpace the AI's ability, rendering the chatbot obsolete to them.

Although there are many existing chatbot systems, universities are also able to develop their own proprietary programs. Kingbot, the chatbot implemented at San Jose State University, and ANTswers, the chatbot program implemented at the University of California, Irvine, are two examples of chatbot programs developed in-house (Rodriguez & Mune, 2022; Kane, 2019). Librarians and library staff can assist with the development of proprietary chatbot software due to the increasing availability of software design programs that allow non-coders to create programs from scratch. Regardless of whether a library adopts an existing chatbot program or develops its own, and regardless of whether they employ tech experts to handle the coding, librarians and library staff must take a hands-on approach to assure the continued usability of the program (Kaushal & Yadav, 2022).

Project Significance:

This project aims to assess to what degree the chatbot function on the USF Library website improves or inhibits a student's user experience with the libraries. Chatbot technology is becoming more and more popular across the internet, and tech-savvy young adults are becoming more and more accustomed to the interface. The data obtained from this project will allow researchers to analyze user satisfaction with the service while also providing valuable data for the program's improvement. Finally, it will increase the opportunity for the chatbot to advertise additional library resources and services, such as face-to-face reference consultations.

Research Goal:

As the current research suggests, continual maintenance and updates to the chatbot interface are required to ensure that it continues to be useful to library users. It is the goal of this study to understand the role that the chatbot interface plays in a library user's experience, as well as their satisfaction with the program.

- Why did students decide to interact with the chatbot?
- How do students rate their satisfaction with the chatbot?
- What ethical issues concern students regarding the chatbot?
- Does the chatbot encourage students to seek out other library services and resources?
- How could the chatbot be improved?

This study aims to assess users' satisfaction with the chatbot interface as it exists now, provide data on how the program can be improved to better suit users' needs, and whether it is an effective tool for advertising/promoting other library services and resources.

Population and Sample

The researchers of this study seek to establish qualitative data observing the implementation and success of the ChatGPT application regarding student engagement on the University of South Florida library's main campus. The sample will encompass all users of the application who take advantage of the ChatGPT service non-discriminatory of demographics, degree level, subject, or purpose. The main campus has a student population of over 50,000 including undergraduate students, master's or doctoral students, and non-degree-seeking students. According to the *USF Libraries Annual Report 2021-22* (2022) of those 50,000, roughly 3,000 (6%) students utilized the chat services last year, and 781 (26%) of the responding students subsequently provided ratings and

reviews. Therefore, the four researchers can estimate roughly the same number of users and responses in their study as the reported data. The data from this survey should be sufficient to provide a preliminary understanding of the impact ChatGPT has on student engagement.

Variables

User experience will encompass two component variables: user satisfaction with the chatbot system and user confidence in interacting with the library. Although a small amount of demographic information (student's year in school/student's path of study) will be collected, this study is not primarily concerned with analyzing the relationship between academic progress and study on their experience with the chatbot system. However, if content analysis produces compelling trends regarding this variable, it could lead to an avenue for future study.

Similarly, another extraneous variable that may affect the dependent variable in this study is whether the student has had previous library instruction. The data collected in this study aims to identify the user's self-reported experience with library services before and after using the chatbot. Although these outside influences could certainly affect how a participant interacts with the library, it is the scope of this study to identify the participant's perception of the influence that can be attributed to the chatbot.

The responses will be analyzed thoroughly and broken down into codes, which will be grouped into larger concepts, and ultimately even larger categories to establish common themes. Content analysis will be conducted by all four researchers, and discrepancies will be discussed to ensure intercoder reliability. The intercoder reliability will be calculated using Cohen's Kappa, and researchers expect to see an intercoder reliability percentage of 85% or higher after discussion, though the initial ICR score (before discussion and resolution) will also be reported.

As with any qualitative study, there are advantages and disadvantages. Self-reported data can be subjective and biased. Participants may be encouraged to overestimate the importance of the independent variable to satisfy the researchers.

Data Collection and Analysis

This survey will be sent via email to the students at USF and will also appear as a pop-up window on the USF library site after the use of the chatbot. Each participant who takes the survey will answer each question applicable to their experience. The prepared survey contains a mixed variety of open-ended and selection questions. The selection questions will provide demographic information, as well as consistent answers that can be put into percentages for easier data analysis. Open-ended questions will provide more in-depth information on how the technology was used by participants, what specifically it was used for, and how the technology could be improved for USF students.

The selection question responses can be grouped into percentages easily, which will provide a good collection of data to analyze from the entire group of respondents. This can be done by assigning numerical values to each response option, which allows them to be tallied by a designated software program. The four researchers will initially use descriptive statistics to provide an overview of the results of the selection question responses. A percentage of the open-ended question responses will be randomly selected to analyze based on the number of survey respondents. With certain programming software, such as Python or R+, the researchers of the study can feed the open-ended responses through the program to extract the most prevalent words or phrases. This ensures survey response data is analyzed and released promptly. Existing literature on chatbot technologies in libraries has discussed that, with routine maintenance and updates, chatbot technologies can be useful in aiding students with accessing library resources. This survey will help

USF determine if the chatbot technology is beneficial to its population, as every student population will vary in their needs and use of library resources.

Evaluation

The researchers of this study will deploy strategies to ensure the integrity and quality of the study. Within the context of qualitative research, the researchers will utilize grounded theory throughout the research process to ensure validity and reliability. Furthermore, the researchers of this study will implement various techniques, which guarantee integrity and eschew bias during the collection, analysis, and interpretation of data. For example, the researchers will include measures, within the survey questions, to avoid elite bias, which stems from an overreliance on data from participants of a particular demographic and socio-economic group. In addition to ensuring integrity and minimizing analytic bias as techniques to evaluate the validity and reliability of the study, this study will also include other elements to evaluate the data.

The four researchers will utilize an intercoder reliability check (ICR) to ensure a high degree of validity and reliability within the qualitative data. Consequently, this study will apply a thematic analysis approach, which concentrates on data content and consists of organizing and coding data to recognize leading themes within the data. Furthermore, this approach is optimal for evaluating the data because it assesses the value and relevance of the data. During the evaluative process of the study, the researchers will use ICR to ensure accuracy, competence, feedback, and legitimacy for the researchers and the study. Furthermore, this study will employ computer-assisted qualitative data analysis software (CAQDAS) to analyze and evaluate specific themes in the qualitative data.

Because this study is applying Cohen's Kappa calculation method, the researchers will use NVivo, a collaborative analysis software, to conduct the coding comparison queries. CAQDAS software is optimal for qualitative studies with large datasets because it breaks down datasets to extract specific trends or patterns within the data. With CAQDAS software, the researchers will also

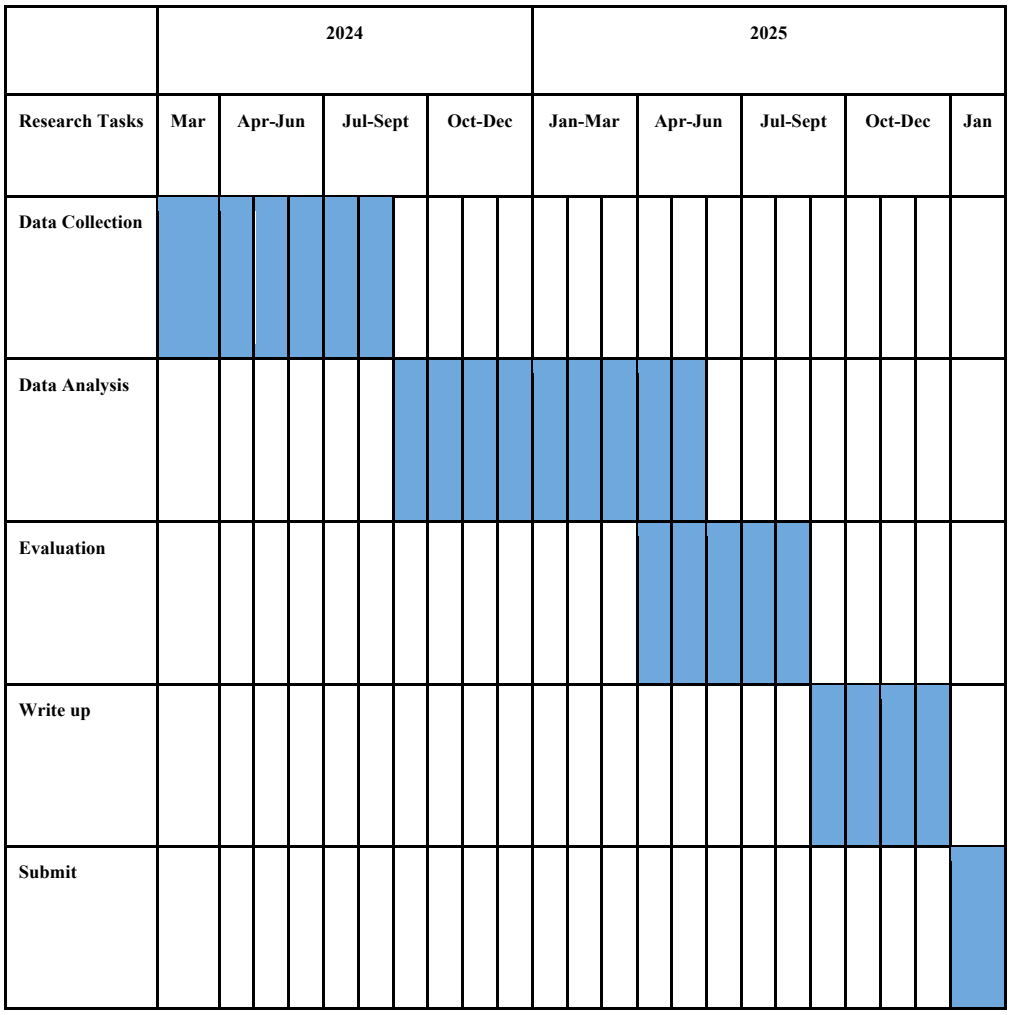
generate data and information visualizations, which provide a visual representation of specific themes within the data. For example, researchers will use word clouds to visually represent prevalent words within the data. Overall, data and information visualization are important tools for evaluating the importance, value, and relevance of the study.

Budget

The materials that will be used include the existing social media accounts (Twitter, Instagram, and Facebook) of the USF Library, the Google survey form, desktop computers currently in use by the researchers, and an email account that will be used for sending the surveys and receiving feedback. The existing USF Library website will also host the survey. There are no anticipated additional costs for these materials. However, the researchers do intend to use some funds to market the survey, including $1,000 for several hundred fliers to hand out to USF students, and posters to put in various buildings on campus. An additional $500 will be put toward promotional giveaway materials, such as fans, pens, and reusable cups, to have at a table during orientation and welcome week. To help with data analysis, the researchers will also purchase a subscription to NVivo, a computer-assisted qualitative data analysis software. The project will require a non-expiring license to the base software, as well as the additional NVivo Collaboration Cloud license, which will allow all four researchers to collaborate at once.

Items	Cost	Total Cost
Marketing	$1,000	$1,000
Promotional giveaways	$500	$1,500
Data analysis software Software license Collaboration license	 $1,019 $449	 $3,018
	Total Cost	$3,018

Timeline (Gantt Chart):



The timeline consists of five distinct research tasks, which will span two years. Each task contains a series of activities. As a plan for the completion of this research project, the researchers have utilized a Gantt chart to structure the timeframe of the project and to estimate the duration of each activity. To stay within budget and the submission deadline, the researchers have included a certain degree of leeway throughout the project to avoid possible delays during the data collection and analysis (Morse & Field, 1996, as cited in Klopper, 2008).

Personnel:

The 4 Academic librarians involved in this research include:

· Malachy Fitzpatrick is an MLIS graduate of the University of South Florida and has a bachelor's degree in history and French, as well as a master's in French from Florida State University. He has professional experience within higher education and public libraries and will use this experience to serve as the principal investigator on the project. He will create the initial survey; establish plans to ensure the reliability of the data; lead regular meetings to discuss, revise and re-examine the study; and collect, analyze, and summarize data.

· Elias Royal is an MLIS graduate of the University of South Florida and holds a bachelor's degree in English Studies with a minor in Communication Studies. Elias will use his exposure to web development tools and specific data programming languages, such as Python and JavaScript, to serve as Co-investigator on the project. He will utilize his experience and knowledge of various data analytic tools to create methods of extracting, separating, analyzing, and documenting data as it arrives. He will also contribute his ideas and questions to the created survey.

· Lauren Geller is an MLIS graduate of the University of South Florida and holds a bachelor's degree in history from the University of Central Florida. She has volunteered her time working in various museums around the country and brings her experience in advocacy, education, and public programming to the project. She will serve in outreach to plan, promote, and encourage the use of the application and its subsequent survey during campus events; respond to questions and/or concerns from survey respondents; contribute ideas and questions to the created survey; and collect, analyze, and summarize incoming data.

· Amanda Gates is an MLIS graduate of the University of South Florida and has a bachelor's degree in history from Eckerd College. She has worked in multiple public libraries and brings her experience collaborating with young adults, outreach, and accessibility advocacy to the project. She will serve in outreach to create and email surveys to all registered and enrolled students; ensure the survey meets the accessibility standards as stated in the Department of Justice's disability law; purchase promotional and marketing materials; and collect, analyze, and summarize incoming data.

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Appendix:

Survey:

In 2023, USF embedded the ChatGPT application into its library database intending to further engage and assist USF students. This survey is designed to gather feedback on its support. Your input will allow USF libraries to measure user satisfaction with the application as USF anticipates expanding ChatGPT across all campuses. Please take a moment to fill out the survey. It is anonymous and your participation is completely voluntary. Please contact Lauren Geller at lauren.geller@usf.edu for questions/concerns.

Question 1: Please select your student classification:

Mark only one oval.

- ◯ Freshman / 1st year undergraduate
- ◯ Sophomore / 2nd year undergraduate
- ◯ Junior / 3rd year undergraduate
- ◯ Senior / 4th year undergraduate
- ◯ Graduate student
- ◯ Non-degree seeking student
- ◯ Other: _____

Question 2: As a student, what is your instructional method?

Mark only one oval.

- ◯ Online education
- ◯ On-campus education
- ◯ Blended-Hybrid education
- ◯ Other: _____

Question 3: Please indicate your college.

Mark only one oval.

- ◯ Arts
- ◯ Arts and Sciences
- ◯ Behavior and Community Sciences
- ◯ Business
- ◯ Education
- ◯ Engineering
- ◯ Global
- ◯ Sustainability
- ◯ Marine Science
- ◯ Nursing
- ◯ Pharmacy
- ◯ Public Health
- ◯ Other: _____

Question 4: What led you to the library's website? What information were you seeking?

Check all that apply.

- [ ] Library hours
- [ ] Research materials; books, articles, etc.
- [ ] Research Consultation
- [ ] Circulation/operations (check-out periods, fines, etc.)
- [ ] Library technology (computers, laptops, printers, etc.)
- [ ] Information about library operations
- [ ] Other: ___

Question 5: Which of the following best describes your current perception of the library's ChatGPT application? (*Select all that apply.)*

Check all that apply.

- [ ] Approachable
- [ ] Accessible
- [ ] Intimidating
- [ ] Overwhelming
- [ ] Other: ___

Question 6: If used for research questions, what type of library resource/material did the chatbot recommend?

Mark only one oval.

- [ ] Database
- [ ] Book
- [ ] Textbook
- [ ] Research consultation
- [ ] Citation tool/guide
- [ ] Did not use for research question
- [ ] Other: _____

Question 7: Currently, ChatGPT responses do not reference the original source, which the Chatbot uses to generate a response. Will you attempt to source the proper references during the research process?

Mark only one oval.

- [ ] Yes
- [ ] No

Question 8: Did the chatbot answer exploratory questions as well as simple questions? If not, how was it different?

_____

_____

_____

_____

_____

Question 9: Did it ask questions to clarify what you were looking for?

Mark only one oval.

- Yes
- No

Question 10: When using ChatGPT for academic research, will you revise the ChatGPT responses?

Mark only one oval.

- Yes
- No

Question 11: Imagine you had an urgent research question. Where would you go first?

Mark only one oval.

- Librarian
- Professor
- Textbook
- ChatGPT
- Search Engine (i.e. Google, Bing, MSN)
- Other: _____

Question 12: When using ChatGPT for a research project, how would you use this AI tool? (*Select all that apply.)*

Check all that apply.

- [ ] To generate research topics
- [ ] To generate thesis statements
- [ ] To generate topic sentences
- [ ] To generate essay examples
- [ ] Other: ___

Question 13: Do you have prior experience using artificial intelligence, or AI?

Check all that apply.

- [ ] Yes
- [ ] No

Question 14: If you answered yes, please specify.

_____

Question 15: On a scale of one to five, with one being the least confident and five being the most confident, how confident did you feel about navigating the USF Library before interacting with the chatbot?

Mark only one oval.

Least Confident

1 ⬭

2

3

4

5

Most Confident

Question 16: On a scale of one to five, with one being the least confident and five being the most confident, how confident do you feel about navigating the USF Library after interacting with the chatbot?

Mark only one oval.

Least Confident

1

2

3

4

5

Most Confident

Question 17: What are your suggestions about the future implementation of ChatGPT in USF libraries?

Question 18: Regarding the use of ChatGPT tool in academic research, what ethical issues most concern you?

Check all that apply.

- [ ] Authorship
- [ ] Citations
- [ ] Plagiarism
- [ ] Other:

Member Contribution:

Malachy Fitzpatrick: Needs Assessment, Literature Review, Project Significance, Research Goal, Variables, Appendix

Amanda Gates: Cover page, Abstract, Data Collection and Analysis, Budget

Lauren Geller: Needs Assessment, Literature Review, Population and Sample, Personnel

Elias Royal: Evaluation, Timeline