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Deliverable #4 – Usability Project Final Report

INLS 690.172 – Fall 2016
12/06/2016
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SILS Website Evaluation

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II. Executive Summary

- We had four participants take part in our usability study of the SILS website. After a demographic survey, they were each given 4 tasks to perform on the site, then they completed a post-task questionnaire for each task, followed by a post-test questionnaire after all four tasks had been done, and finally the participants discussed their experience of the site through a semi-structured interview
- From testing sessions and data, we found several significant advantages and issues:
    - Some participants remarked that they did not know that the SILS website had a particular function until they took part in our study. Thus, a major advantage of the site is the volume of information on it.
    - However some areas of the site can be difficult to locate because of various issues with the information architecture of the site such as pages with only one path to them, inconsistencies in the sidebar, and unintuitive categorization.
    - Additionally, the search bar can be useful if the intended page is buried within the site, but it can be difficult for non-native English speakers to use because it depends on searches using exact keywords
- Based on our findings, we recommend the following:
    - Highlighting useful functions (such as the “Current Students” and “Student Jobs” sections of the site)
    - Simplifying the overall information architecture perhaps by conducting further research into how to categorize the site through a card sorting study
    - Improving the search function on the site by adding features such as query suggestions
    - Increasing the consistency between pages of the sidebar
    - Updating the overall look of the site to make it more modern

III. Overview

The SILS website is a department-specific website hosted by UNC for the School of Information and Library Science. It is a central hub for information about SILS events, faculty, research, courses, and degree programs, among other topics. The website is publicly accessible, but its main target audiences are current students, prospective students, faculty/staff, and alumni. The URL for the SILS website home page is https://sils.unc.edu.

Our team selected the SILS website for usability evaluation because it is a repository of valuable resources for those affiliated with or interested in SILS. This website should be a reflection of the department’s expertise in making information accessible in an organized manner. However, personal experiences with this system have revealed

sections that may be confusing, frustrating, or otherwise unappealing to users. At the highest level, the goal of this usability evaluation is to determine how efficiently and effectively users are able to get the information they need from the SILS website. Because SILS is local, we hope to positively impact its website with our evaluation.

IV. Purpose of the Usability Evaluation

In light of personal and departmental concerns about the usability of the SILS website, we evaluated several aspects of the site to produce recommendations for future redesign work. To make informed, focused recommendations, we limited the scope of our project to the sections of the site related to Current Students, Programs, and Careers. These are sections of the site where members of our team have personally encountered issues. However, due to time and resource constraints, we did not consider the sections related to Courses, the SILS Library, SILS IT, People (Faculty & Staff), Alumni, Giving to SILS, Research, and Future Students.

Our primary goal for this evaluation was to assess how well users are able to navigate through the site. Since navigation requires several different types of comprehension, we evaluated the information architecture, graphical layout, and terminology used on the site. Each of these aspects presents possible problems or “pain points” for users. Additionally, we evaluated user satisfaction with the site.

V. Usability Evaluation Goals

Below are more specific goals that were selected for evaluating parts of the SILS website that our team is particularly interested in focusing on. These goals were structured into specific tasks for the usability test.

- Can a student find/download the MSIS course planning worksheet?
- Can users find information about the degree program and/or specialization they are interested in?
- Are students able to find student internship listings on the website?
- Are users able to locate the requirements that need to be fulfilled before they start a field experience?

VI. User Profiles and Use Cases

We identified four main subgroups of SILS website users: current SILS students, prospective students, SILS alumni, and department faculty and staff.

The first class of users we identified is current students who are studying in SILS programs. Since they are gaining knowledge from taking SILS courses and being involved in campus events, their familiarity with library/information science (LIS) field jargon and UNC-specific terms ranges from intermediate to high level. Their goals in using the SILS website are mainly finding information about education and career opportunities within the program and locally. To be more specific, they are seeking information about their academic interests, course plans for each semester, tips for their career development, and/or intern or job opportunities in LIS fields. They may use similar websites or applications to reach the same goals, such as UNC Learning Center, Google, Careerolina, Linkedin, and other job/internship listserv subscriptions.

The second group of users that we identified is prospective students who are interested in LIS. As these students are not currently enrolled in an LIS program at UNC, they most likely have low knowledge of UNC-specific terms and low familiarity with LIS jargon. Prospective students may also be unsure of their academic and/or career aspirations. These users could be visiting the SILS webpages in order to compare LIS or Computer Science departments across universities, or to compare SILS to other UNC departments. The potential goals of prospective student users include finding information about what SILS has to offer, such as programs and professors, as well as logistics like applying to the school and receiving financial aid. These users may also want to use the SILS website to research career prospects.

The third group of users is SILS alumni. As these users graduated from the SILS program at UNC, they probably have high familiarity with UNC terms and field jargon. However, depending on how many years it has been since the alum graduated, the website and department may have changed substantially, so they could be a novice or an expert user of the SILS website. Alumni users' possible goals include: donating to SILS, finding information about SILS events, networking, and looking for job opportunities.

The final main group of users is the current SILS faculty and staff. As they are currently employed by SILS, they most likely have high familiarity with UNC terms and field jargon. The faculty and staff users have different goals for the SILS website according to their job position. These could include reserving rooms, learning about SILS events, performing administrative tasks, and training.

Our usability evaluation focused on the current student user class. Possible use cases include:

- A current MSIS student has an upcoming appointment with their advisor, and would like to download and fill out the MSIS Course Planning Worksheet prior to the appointment. (Advising Worksheet Task)

- An MSIS student who has recently become interested in a particular subject is finding information about a related MSIS specialization to find out whether it matches their interest. (Specialization Task)
- A SILS student is interested in finding student internship opportunities in LIS. (Internship Finding Task)
- A SILS student uses the Field Experience Page in order to find information about Field Experience requirements and locations. (Field Experience Task)

VII. Method

A. Test Design

We conducted a within-subjects test with 4 students from INLS 690-172 Usability Evaluation and Testing. Participants were selected by Dr. Capra. Each participant completed the same 4 tasks, which were counterbalanced to mitigate order effects. Test sessions lasted approximately 45 minutes each. We began sessions by collecting basic background information about the participant and their previous use of the SILS website. Next, participants completed 4 tasks involving navigation on the SILS website. After each task, participants completed a brief 4-5 question post-task questionnaire. Sessions concluded with a post-test questionnaire followed by a semi-structured debriefing interview. For all testing materials, see Appendix B.

B. Test Environment

We used a research laboratory in the Interactive Information Systems Laboratory of Manning Hall (Room G09). This setting is intended to be secluded to minimize distractions for the participant, and the hardware is already set up with Camtasia for screen and audio recording. All participants used the Google Chrome browser. We aimed to keep the test environment and materials consistent between participants to minimize the presence of confounding variables.

C. Equipment and Materials

Laboratory equipment:

- Computer with Camtasia screen/audio recording software, as well as a mouse.
- 1 table for the participant.
- 3 chairs (for moderator, participant, and note-taker).

Moderator materials/equipment:

- Moderator guide and script - see Appendix A. Also includes paper copies of the items below - see Appendix B:
    - Each task prompt to give the participant.
    - Pre-test demographic background survey.
    - Post-task questionnaire for each task.
    - Post-test questionnaire.
- Laptop with word-processing software to record participant responses to post-test semi-structured interview.

Note-taker materials/equipment:

- Note-taking guide.
- Laptop with word-processing software to record observations and participant responses.

Tech support materials/equipment:

- Laptop with internet/email capabilities.
- Soft copies of all testing materials (e.g. scripts, materials to give participant, etc).

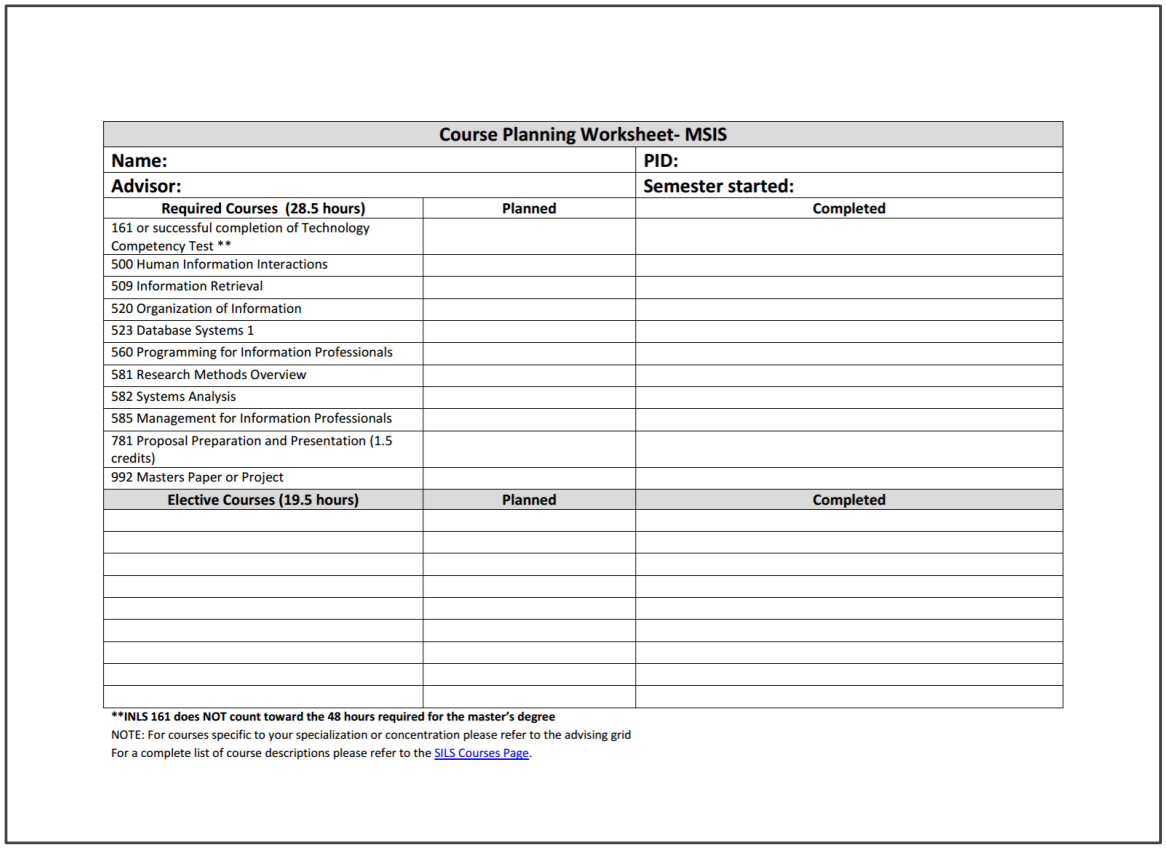
D. Task List and Descriptions

All of our test participants performed the same four tasks; however, to mitigate the learning effect, the order of the tasks was counterbalanced between participants (See Appendix E). All four of these tasks involve an element of navigating the Current Students, Programs, or Careers sections of the SILS website. For each task, the moderator first read the task prompt to the participant, and then gave them a printed copy of the prompt to refer to for the duration of the task. In order to gauge the organization of these parts of the site, all tasks began with the participant on home page of the SILS website (https://sils.unc.edu). These tasks were selected from prior deliverables because they are common tasks for which students use the SILS website, yet personal experiences suggest that students might encounter confusion or frustration while performing them.

Advising Task: Find and open the MSIS course planning worksheet.

The moderator asked the participant to locate and open the MSIS course planning worksheet. The participant was instructed to verbally indicate to the moderator when they felt they had completed the task. Successful completion of the Advising Task was indicated if the participant had navigated to and opened the MSIS course planning worksheet in their browser.

This task was specifically selected because advisors often request that students fill out a copy of the MSIS course planning worksheet prior to or during advising appointments. Students may also use it independently to help plan their classes ahead of time. The task helps evaluate navigation to and within the Current Students section of the SILS website.



Course Planning Worksheet- MSIS

Name:		**PID:**
Advisor:		**Semester started:**
Required Courses (28.5 hours)	**Planned**	**Completed**
161 or successful completion of Technology Competency Test **		
500 Human Information Interactions		
509 Information Retrieval		
520 Organization of Information		
523 Database Systems 1		
560 Programming for Information Professionals		
581 Research Methods Overview		
582 Systems Analysis		
585 Management for Information Professionals		
781 Proposal Preparation and Presentation (1.5 credits)		
992 Masters Paper or Project		
Elective Courses (19.5 hours)	**Planned**	**Completed**

****INLS 161 does NOT count toward the 48 hours required for the master's degree**

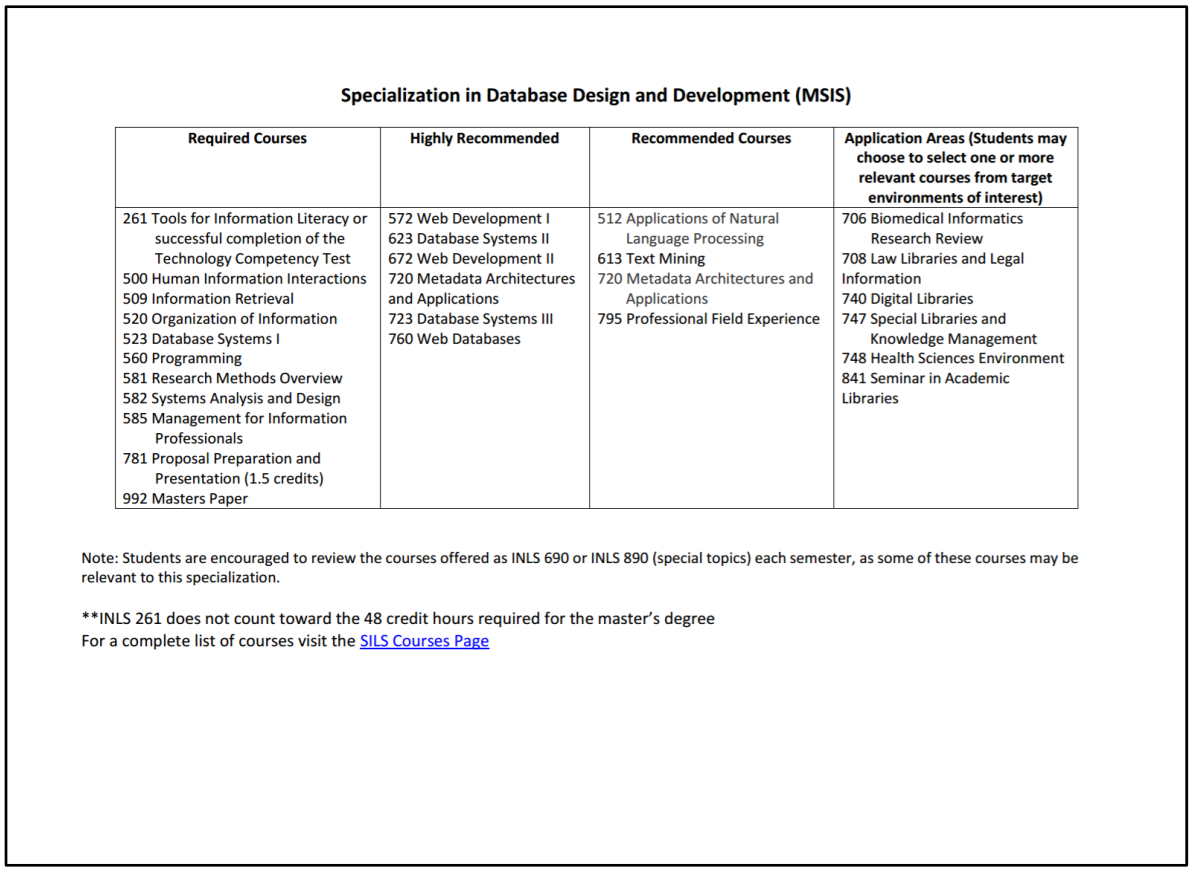
NOTE: For courses specific to your specialization or concentration please refer to the advising grid

For a complete list of course descriptions please refer to the SILS Courses Page.

Specialization Task: Find the recommended courses for a concentration in Database Design and Development.

The moderator asked the participant to locate information regarding the Database Design and Development specialization. The participant was instructed to verbally indicate to the moderator when they felt they had completed the task. Successful completion of the Specialization Task was indicated if the participant had navigated to and opened the PDF of Database Design and Development Specialization.

This task was selected because students often need academic recommendations to assist in their course planning, especially when they have a particular interest. Also, they may check recommended courses of each specialization to see which one matches their interest. The task helps evaluate navigation to and within the Program section of the SILS website.



Specialization in Database Design and Development (MSIS)

Required Courses	Highly Recommended	Recommended Courses	Application Areas (Students may choose to select one or more relevant courses from target environments of interest)
261 Tools for Information Literacy or successful completion of the Technology Competency Test 500 Human Information Interactions 509 Information Retrieval 520 Organization of Information 523 Database Systems I 560 Programming 581 Research Methods Overview 582 Systems Analysis and Design 585 Management for Information Professionals 781 Proposal Preparation and Presentation (1.5 credits) 992 Masters Paper	572 Web Development I 623 Database Systems II 672 Web Development II 720 Metadata Architectures and Applications 723 Database Systems III 760 Web Databases	512 Applications of Natural Language Processing 613 Text Mining 720 Metadata Architectures and Applications 795 Professional Field Experience	706 Biomedical Informatics Research Review 708 Law Libraries and Legal Information 740 Digital Libraries 747 Special Libraries and Knowledge Management 748 Health Sciences Environment 841 Seminar in Academic Libraries

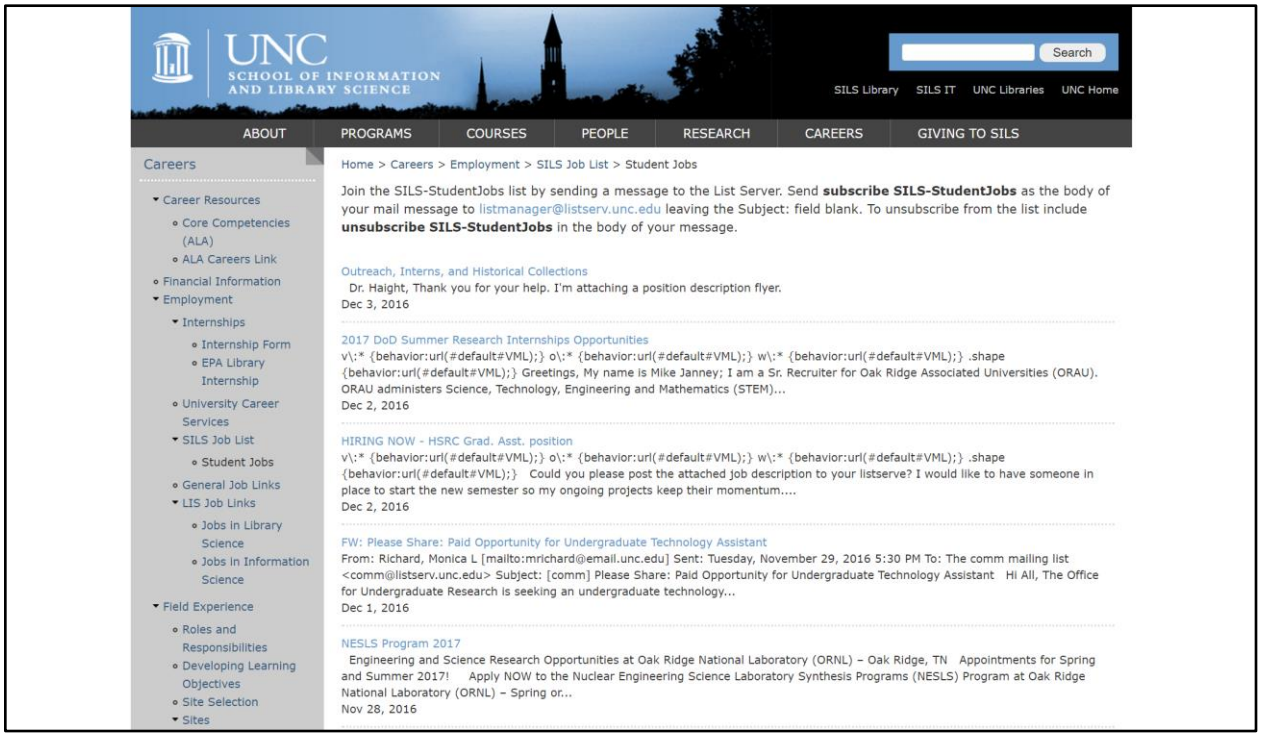
Note: Students are encouraged to review the courses offered as INLS 690 or INLS 890 (special topics) each semester, as some of these courses may be relevant to this specialization.

**INLS 261 does not count toward the 48 credit hours required for the master's degree
For a complete list of courses visit the SILS Courses Page

Internship Task: Locate a description for a currently-available student internship.

For this task, the participant was asked to navigate the SILS website in order to locate the webpage with a generated list of open positions, and to then use this interface to locate a student internship. The participant was instructed to verbally indicate to the moderator when they felt they had completed the task. The participant is successful if they arrive at the “SILS Student Jobs List” page.

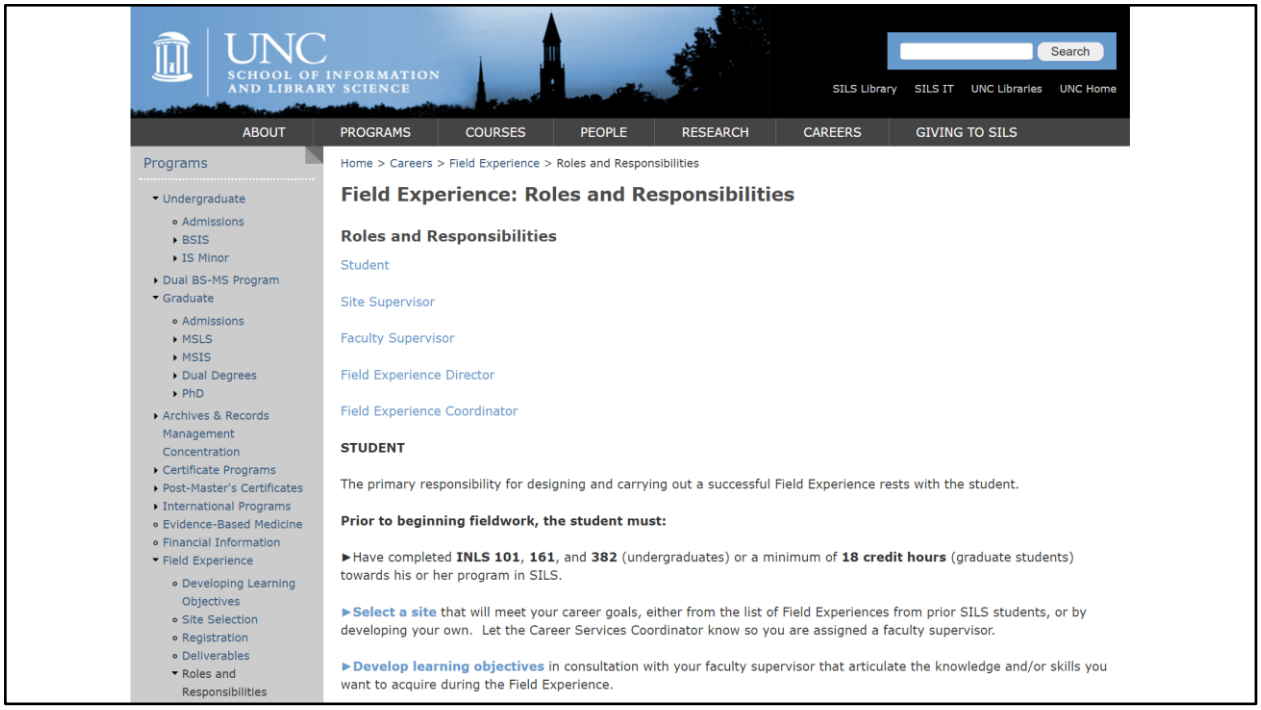
This task was selected from our previous deliverables because the particular page on which one would find a student internship is buried within the Careers section of the website, and thus this task was created to help evaluate the organization of the site.



Field Experience Task: Locate the requirements that need to be fulfilled before you start a field experience.

The participant was asked to find information about field experiences in the Careers section of the SILS website. The participant was instructed to verbally indicate to the moderator when they felt they had completed the task. Successful completion of the Field Experience Task was indicated in one of two ways: finding the “Roles and Responsibilities” page, or finding and opening the Field Experience Agreement form. While these pages have information formatted differently, both include the learning objectives written component for establishing a field experience.

Field experiences can be an important part of a graduate student’s experience at SILS and the Career Services Coordinator maintains a handful of pages related to them on the SILS website. This task was selected because prior experience and the results of cognitive walkthroughs indicated that there may be usability problems with these pages including confusion over labels and lack of clarity of page content. Given the importance of field experiences, finding and fixing issues may yield a large positive impact for site users.



UNC SCHOOL OF INFORMATION AND LIBRARY SCIENCE

FIELD EXPERIENCE AGREEMENT

Please review agreement with your Site Supervisor and Faculty Supervisor. **COMPLETE AND RETURN THIS FORM TO THE FIELD EXPERIENCE COORDINATOR BEFORE THE FIRST DAY OF CLASS or BEFORE YOU BEGIN SITE WORK.**

FIELD EXPERIENCE INFORMATION

Student Information	Site Information
Name:	**Site Name:**
PID:	**Site Supervisor:**
Degree (check one): ❒ BSIS ❒ MSIS ❒ MSLS ❒ PHD	**Address:**
E-mail:	
Term/Year Registered:	**E-mail:**
Field Experience Faculty Supervisor:	**URL:**
Academic Faculty Advisor:	**Dates of FE:**

FIELD EXPERIENCE DESCRIPTION

On a separate sheet of paper, respond to the following and attach to this form:

E. Evaluation Session Main Sequence of Events

For each participant, our team followed the below sequence of events:

1. Arrange the date, time, and location for the testing session
2. Arrive at the testing location 20 minutes before the scheduled testing session (to allow time for set-up)
3. Set up the testing location for the session:
    a. The technical support will ready the laboratory room and the laboratory's computer for Camtasia recording and the usability test itself. (This includes opening the computer's Google Chrome browser, clearing the browser history, navigating to the SILS website homepage, and then opening a blank tab over it.)
    b. The moderator and note-taker will each prepare their respective materials. (For the moderator, this includes ensuring they have copies of their script and papers that will be presented to the participant. For the note-taker, this includes making sure their note-taking guide is ready.)
4. Moderator: Meet/greet the participant and introduce them to the project/session. (This includes going over the informed consent form.)
5. Moderator: Give the participant the background survey to complete.
6. Once the participant completes the background survey, the moderator will begin the Camtasia recording. The note-taker should begin taking notes at this point.
7. Moderator: For each task, give the participant a paper stating the task and read the task to the participant. After the task is completed, give the participant the post-test questionnaire for that task, reset the browser to the SILS website homepage, and open a blank tab.
8. Moderator: After the participant has completed the post-task questionnaire for the last task, give the participant the post-test questionnaire.
9. Moderator: After the post-test questionnaire is completed, conduct the semi-structured post-test interview with the participant.
10. Moderator: End the Camtasia recording. Thank the participant for their time before they leave.
11. Regroup with team, process the Camtasia recording, and upload it to UNC's Microsoft OneDrive.
12. Wrap up the session: Collect material and reset the laboratory room to its initial setup.

VIII. Roles of the Team During Evaluation

During testing, our team consisted of one moderator, one note taker, and one technical support person. After each testing session, the three team members held a short debrief about how the testing session went and any interesting findings.

- The moderator was tasked with interacting with the subject and following the moderator guide.
- The note taker recorded observations about the subjects' actions during the usability test.
- The technical support person ensured that the environment is set up and working prior to the beginning of each session, and was on-hand during usability testing in the event of technical problems.

Moderator

- Pre-test preparation
    - Reviewed moderator guide and scripts.
    - Asked for all printed documents or materials from technical support that will be used or handed out to participants during testing session.
    - Managed all printed documents or materials in a proper order.
- Immediately before each testing session
    - Met the participant and walk him/her into the testing room.
    - Introduced other team members and briefly explain their roles during the session to the participant.
- During testing session
    - Read from scripts.
    - Told the participant the purpose of the study and how their participation would contribute to the study.
    - Reviewed informed consent with participant, making sure they understood how data collected from them will be used.
    - Got all essential permissions from the participant.
    - Introduced sequence of tasks and what they were expected to do in each task.
    - Made sure the participant stays on task.
    - Comforted or encouraged the participant if they showed negative emotional reactions.
    - Assisted the participant appropriately if asked.
    - Asked appropriate questions if the participant was showing hesitation, confusion, or frustration, or did something unexpected.
    - Gave questionnaires to participant at appropriate times.
- After testing session

- Interviewed the participant.
- Expressed appreciation for their participation, and debriefed if necessary.

Note-Taker

- Pre-test preparation
  - Created a folder in UNC Microsoft OneDrive for notes storage.
  - Made sure their laptop worked smoothly for note-taking.
  - Set up their laptop before each participant entered the room.
- During testing session
  - Noted the actions that indicate the participant's emotion.
  - Noted the process of the task when the participant showed uncertainty.
  - Noted any unexpected behavior.
  - Noted any comments from the participant that may reflect how they felt during the test.
  - Recorded any questions that participant asked.
  - Recorded participant's responses to the questions asked by the moderator.
  - Recorded completion and extent of success for each task.
  - Recorded any help that was given to the participant.
- After testing session
  - Recorded number of total clicks and backtraces when completing each task.
  - Organized notes and upload into the UNC Microsoft OneDrive folder.
  - Input data from questionnaires into spreadsheet.

Technical Support

- Pre-test preparation
  - Created a folder in UNC Microsoft OneDrive for video storage.
  - Printed out all documents or materials that were used or handed out to participant during test session including:
    - Moderator guide and script
    - Tasks introduction
    - Consent form for each participant
    - Survey and questionnaires for each participant
  - Emailed the participant to confirm their appointment (time, place, people) one day before the test day.
  - Set up lab computer and checked to make sure Internet access was available.
  - Set up Camtasia recording and tested Camtasia by recording a short video to make sure the computer performed smoothly while running Camtasia.

    - Reviewed the test video to make sure the screen capture and voice recording were appropriately recorded.
    - Opened Chrome browser and SILS website (https://sils.unc.edu/)
    - Set up the lab room with:
        - One chair in front of the lab computer for the participant
        - One chair (with wheels) slightly beside and behind the participant's chair for the moderator
        - One chair on the other side of the participant, but a little farther away from them for the note taker
    - Checked to make sure all cell phones and electronic devices were on silent.
- During testing session
    - Was prepared for any unexpected technical issue.
- After each testing session
    - Saved Camtasia recording with date, participant's number and uploaded it to the UNC Microsoft OneDrive folder
    - Quit Camtasia and deleted any other recordings made (such as the test recording).
    - Wiped browsing history and cookies made by the last participant.
    - Gathered participant's completed documents.

IX. Data Collection

At the beginning of each session, a brief demographic survey was conducted to gauge each participant's background familiarity and experience with SILS and the SILS website.

For all four tasks, Camtasia was used for both screen recording and audio recording to collect data. A dedicated note taker was also present during each testing session so that the moderator could focus on interacting with the participant. For the purposes of this class project, the data was downloaded from Camtasia and uploaded to and stored in UNC's Microsoft OneDrive .

Specific measures and metrics used for each task are detailed in the following section (IX. EVALUATION MEASURES). After each task, participants were asked to complete a brief post-task questionnaire to evaluate their perceptions of that task (for example, how confident they were about that task). The post-task questionnaire (See Appendix B) was a modified version of the ASQ created by James R. Lewis (1991)[1].

Following completion of the last task's questionnaire, participants were given a longer post-test questionnaire that evaluated general usability using the System Usability Scale. This post-test questionnaire was followed by a verbal semi-structured interview during which the participant was given the chance to express any thoughts, ideas, or impressions that they may not have been able to otherwise.

Paper surveys were used to collect survey data .

[1] Lewis, J. R. (1991). Psychometric Evaluation of an After-Scenario Questionnaire for Computer Usability Studies: the ASQ. SIGCHI Bulletin, 23(I), 78–81. https://doi.org/10.1145/122672.122692

X. Evaluation Measures

For each task, the participant's screen was recorded, and from this video, we measured:

- Task success using a binary yes or no scale.
- Time on task, which was the time from when the participant opened the tab with the SILS homepage until they verbally confirmed to the moderator that they had finished.
- Total number of pages viewed (not unique pages viewed) - we changed this from our original plan to count number of clicks as we realized that the number of pages viewed was a more valuable number for evaluating the organization of the site.
- Number of backtracks, which included clicking the back arrow, starting over from the homepage, using the breadcrumbs, and visiting a page that the participant had already been on, using a path that they had previously used to get there.

How did these evaluation measures align with our overall usability evaluation goals?

All of our tasks were reasonably achievable, meaning that we did not give our participants any task designed to end in failure. Our evaluation measures of task success, time on task, total number of pages viewed, and number of backtracks all were used to gauge how the navigability of the site impacted the participants' completion of the tasks. We estimated how difficult it was to find certain pieces of information based on how long it took the participants to reach an answer, how many steps it took them to get there, and how often they went backwards in the information hierarchy. Generally, the more difficult a task, the more time, pages, and backtracks it will take. We examined the site's information architecture, graphical layout, and terminology in conjunction with the participants' paths through the site and the evaluation measures we gathered in order to investigate what issues arose, hypothesize why those issues occurred, and provide suggestions for how to minimize these issues.

XI. Results

Participant Demographics

According to our pre-test survey:

- 3 out of our 4 participants were 1st year MSIS students. The remaining participant was a 4th year non-SILS undergraduate student.
- 2 out of our 4 participants said they never use the SILS website. The remaining 2 participants said they used it occasionally (rated 3 and 4 out of 7 maximum), but not with daily frequency.
- For the 2 participants who reported occasionally using the SILS website, the most frequent sections browsed were listed as SILS Courses and Faculty.

Advising Task Results

Results of measures

- Previous experience: one of participants reported on the post-task questionnaire that they had previous experience with this task, although one participant thought the location of the advising document had moved, saying “it was here” while they completed the task.
- Success rate: 100% of participants (4 out of 4) successfully completed this task.
- Time on task: the average was 117 seconds (the standard deviation was 38.58 seconds).

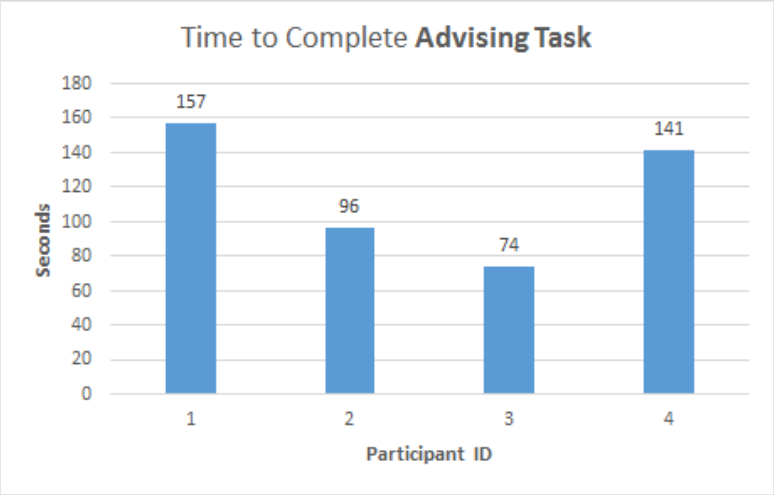


Figure 1. Time to Complete Advising Task

- Backtracking (backtracking/total # pages viewed ratio): approximately 10% (0.0992). Two participants backtracked during this task, and the participants that did not backtrack completed the task successfully viewing only 5 pages.

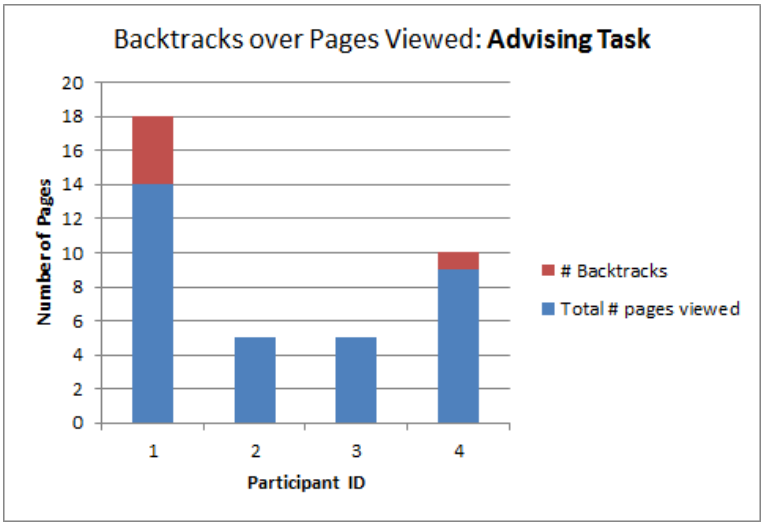


Figure 2. Number of Backtracks over Pages Viewed on Advising Task

- Post-task questionnaire averages: using a scale of 1 to 7 (where 1 is strongly disagree and 7 is strongly agree), on average participants rated the site as a 3.5 for easy to use for this task, a 3.25 for the amount of time this task took them to complete, and a 5.5 for whether they would use the site to complete this task.

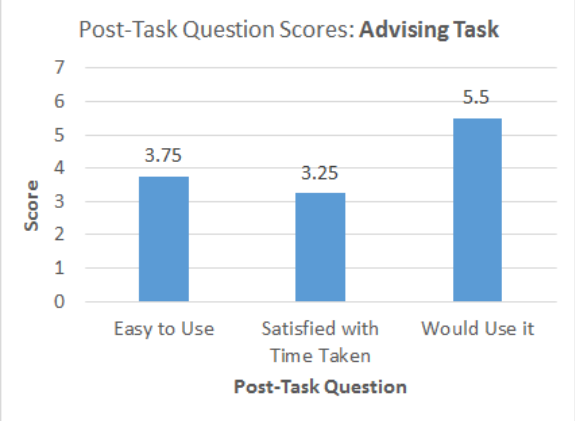


Figure 3. Average score of Post-Task Questions (Advising Task)
(1 = strongly disagree; 7 = strongly agree)

- Issues with this task performance: this was the only task where all four participants used the search function in order to complete the task. While we did not explicitly instruct participants to refrain from using the search bar, we had previously assumed that the search function was out of scope for this project. We left searching out of previous deliverables because, in our experience of the SILS website, the search function is seldom used and the advising form was accessible by first clicking on “Current Students” or by navigating to the “Forms” page.

- Implications from the findings:
    - This advising form may not be located in an intuitive location as all four of our participants at some point navigated through the “Programs" - “MSIS” section to find the desired page, but could not so they resorted to searching. Additionally, Participant 1 stated that the form could have been in a “more logical place.”
    - As the team outlined in a previous deliverable, our action sequence for this task hinged upon using the “Current Students” section of the site, and none of our participants clicked this link from the homepage in any of the tasks. This suggests that the homepage could be restructured to either emphasize “Current Students” or integrate the information within this section with the rest of the site.
    - Furthermore, this task was completed by finding the “Forms” page through the search results, not by navigating through the site. As the “Forms” page includes many important forms for SILS students but was not easily found by our participants, perhaps it should be made more prominent.
- Summary: the participants were all able to locate this advising form eventually, although this was the task with the longest average time for task completion (117 seconds) and none of the participants used the only direct route to the “Forms” page - through “Current Students.” Instead, all of our participants used the search bar to find this form, which seems to indicate that more investigation should be performed in order to discover why users aren’t clicking on “Current Students” and how to improve the visibility of the “Forms” page.

Specialization Task Results

Results of measures

- Previous experience: two out of four participants reported that they were familiar with this task (one of whom, participant 1, came across the page during their first task). Both of these experienced participants completed the task with a minimal number of actions.
- Success rate: 100% of participants (4 out of 4) successfully completed this task. Two participants (P1 and P4) completed the task within minimal number of actions. The other two participants also completed this task successfully without searching.
- Time on task: the average time for this task was 77 seconds (with a standard deviation of 71.12 seconds).

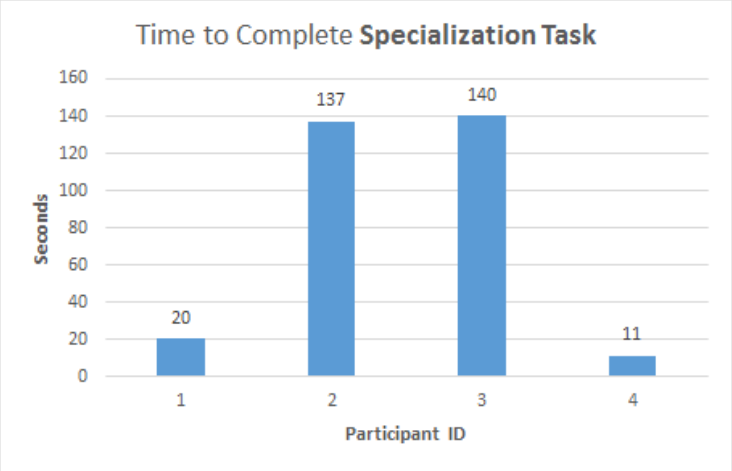


Figure 4. Time to Complete Specialization Task

- Backtracking (backtracking/total # pages viewed ratio): approximately 5% (0.05) - one participant (P2) backtracked between Programs and Courses.

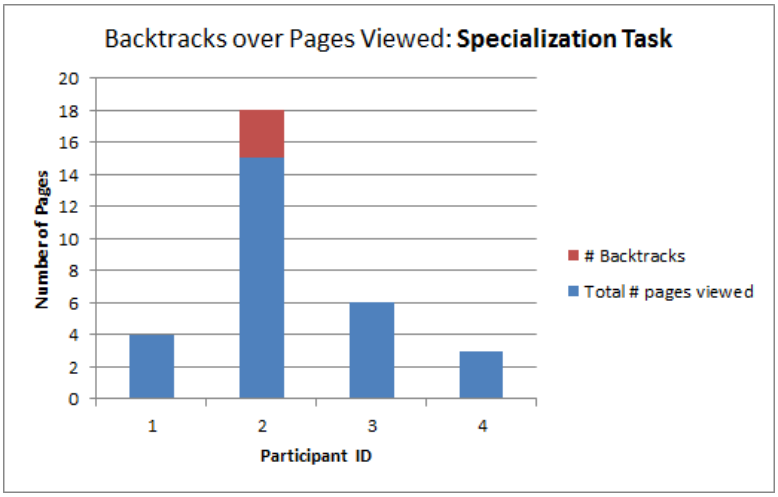


Figure 5. Number of Backtracks over Pages Viewed on Specialization Task

- Post-task questionnaire averages: using a scale of 1 to 7 (where 1 is strongly disagree and 7 is strongly agree), on average participants rated the site as a 4.5 for easy to use for this task, a 5 for the amount of time this task took them to complete, and a 5.75 for whether they would use the site to complete this task.

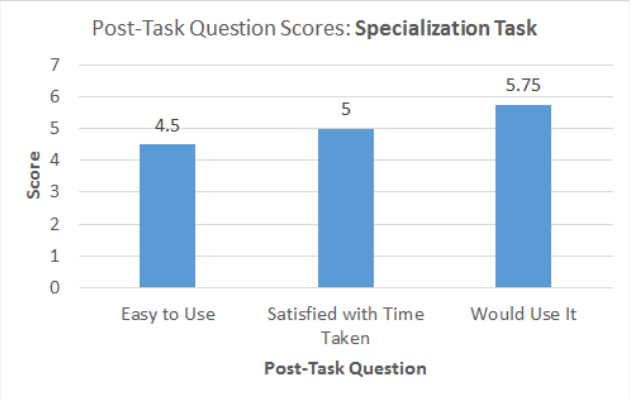


Figure 6. Average score of Post-Task Questions (Specialization Task) (*score 1 = strongly disagree; 7 = strongly agree)

- Issues with this task performance: none.
- Implications from the findings:
  - The fact that the participants with previous experience with this task were able to complete it so much faster than those who reported no previous experience could suggest that this task has good learnability, but this was not a metric we studied. It could be a topic for future research.
  - Two participants (those without previous experience who took longer to complete the task) first looked for specializations in the “Courses” section of the site and they both visited “Special Topics.” This seems to indicate that they expected to find courses related to a specialization in the “Special Topics” section, and could have misunderstood the terminology as both include the word “special.” Eventually these participants turned to the “Programs” section, which suggests that this categorization is reasonable.
- Summary: like the advising form task, all of the participants were able to complete this task, but either they had done the task before and went straight to the specialization page, or they had to do a lot of exploring in order to find it.

Internship Task Results

Results of measures

- Previous experience: two participants reported they had previous experience with the task (P2, P4).
- Success rate: 100% of participants (4 out of 4) successfully completed this task.
- Time on task: the average time for this task was 86 seconds (with a standard deviation of 43.99 seconds).

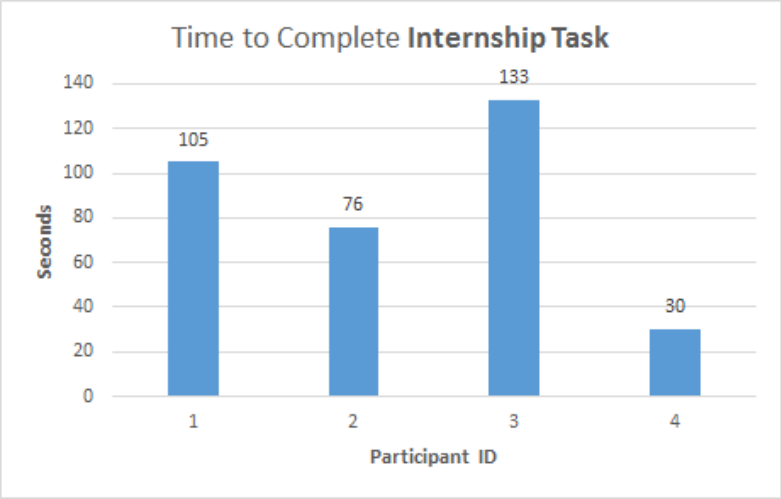


Figure 7. Time to Complete Internship Task

- Backtracking (backtracking/total # pages viewed ratio): approximately 4% (0.04) - one participant navigated to other job pages after finding the desired page.

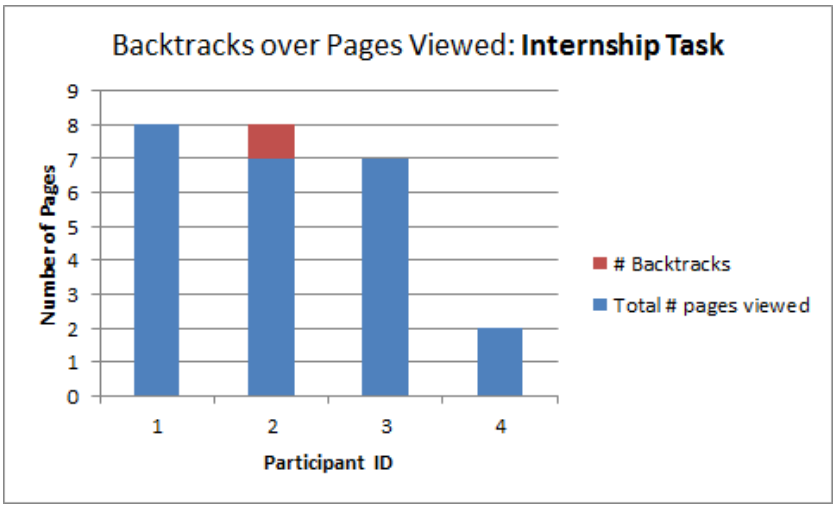


Figure 8. Number of Backtracks over Pages Viewed on Internship Task

- Post-task questionnaire averages: using a scale of 1 to 7 (where 1 is strongly disagree and 7 is strongly agree), on average participants rated the site as a 5 for easy to use for this task, a 5 for the amount of time this task took them to complete, and a 6.25 for whether they would use the site to complete this task.

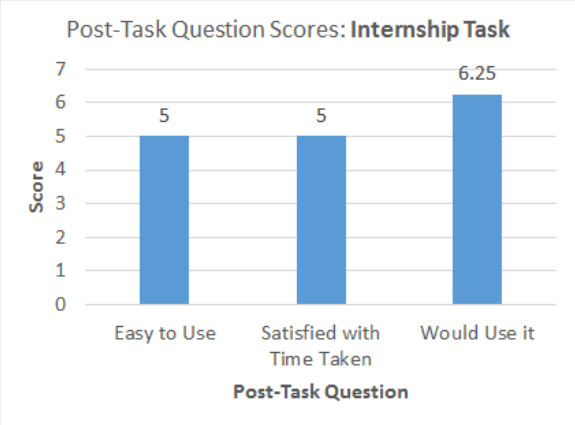


Figure 9. Average Score of Post-Task Questions (Internship Task)
(1 = strongly disagree; 7 = strongly agree)

- Issues with this task performance: originally the team decided that successful completion of this task meant navigating to the “Student Jobs” page and clicking on one of the positions posted. Three of the participants successfully navigated to the “Student Jobs” page but neglected to click on one of the job listings and some appeared unsure that they had found the correct page (saying things like “I think I’m done”). This leads us to believe that perhaps the participants did not fully understand the task prompt as we had written it, so we amended successful completion of this task to include navigating to the “Student Jobs” page without selecting a specific position.
- Implications from the findings:
    - Three participants completed the task by navigating in the “Careers” section. One participant started from the “Programs” section, then used the search box to find the internship page. This may indicate that some students conceptualize a field experience as a career position while others conceptualize it as part of an academic program. Thus, perhaps the terminology and/or organization of the site should be amended to account for both of these viewpoints.
    - One participant (P2) stated in the post-test interview that they found this task confusing as “you have so many options,” meaning that they saw multiple pages in the “Careers” section that included job posting information. This participant visited “SILS Job List,” “Student Jobs,” “General Job Links,” and “LIS Job Links” before backtracking to “Student Jobs.” They mentioned that the various job pages made them confused even though they had done this task before participating in the study. This could show that the abundance of similar pages create a disorganized structure, or that our task prompt was not clear enough.
    - Additionally, P4 shared with us during the interview that they had used this part of the website before and had needed another student to show them where the student jobs section of the site was. This could be an

indication that currently available student positions are buried too deep within the information architecture to be found easily.

- Summary: the part of the SILS website dedicated to currently available student jobs and internships is difficult to uncover within the information architecture (page hierarchy, terminology, etc) of the site. There are many pages that are related to student positions, burying the one we were examining, and a student user may conceptualize an internship as part of their program, as opposed to a career opportunity.

Field Experience Task Results

Results of measures

- Previous experience: only one participant reported having previous experience with this task, but they were not successful.
- Success rate: 25% of participants (1 out of 4) successfully completed this task.
- Time on task: the average time for this task was 115.25 seconds (with a standard deviation of 65.58 seconds).

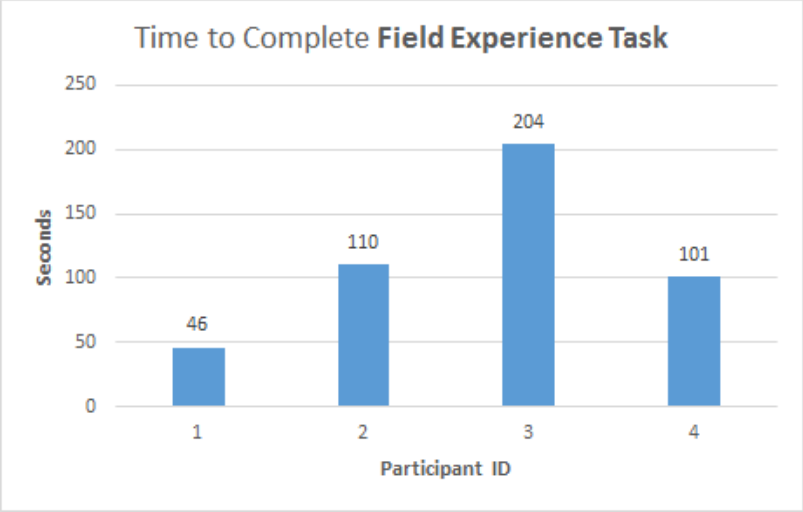


Figure 10. Time to Complete Field Experience Task

- Backtracking (backtracking/total # pages viewed ratio): approximately 20% (0.21) - the largest backtracking rate. Three out of four participants backtracked during this task.

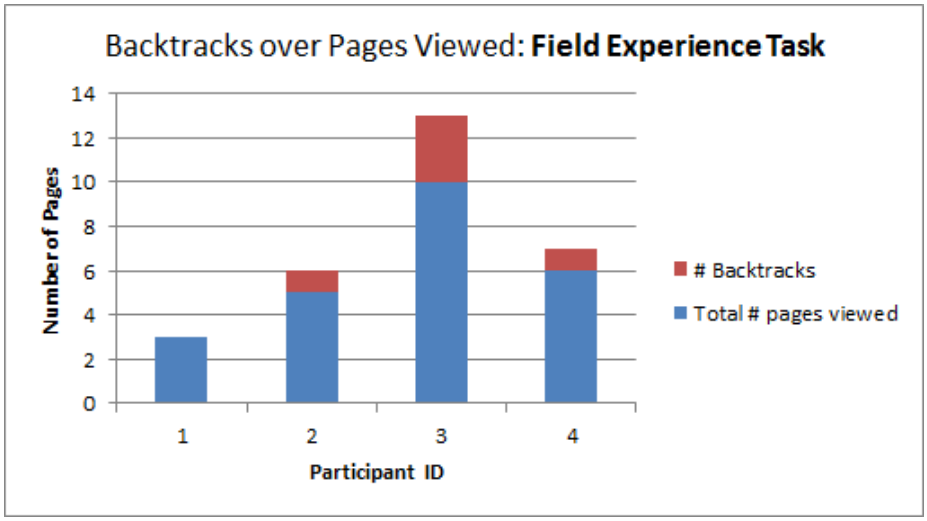


Figure 11. Number of Backtracks over Pages Viewed on Field Experience Task

- Post-task questionnaire averages: using a scale of 1 to 7 (where 1 is strongly disagree and 7 is strongly agree), on average participants rated the site as a 4.5 for easy to use for this task, a 4.75 for the amount of time this task took them to complete, and a 6 for whether they would use the site to complete this task.

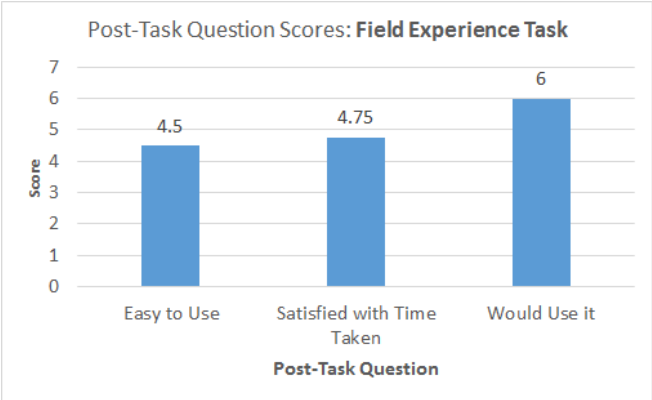


Figure 12. Average Score of Post-Task Questions (Field Experience Task) (*score 1 = strongly disagree; 7 = strongly agree)

- Issues with this task performance: this task was meant to examine how well the SILS website explains the requirements that must be fulfilled before beginning a field experience. These requirements include completing the Field Experience Agreement and writing a short essay on the student's learning objectives. We spent a lot of time figuring out how to word this task so that it would be clear that there was a defined endpoint (the Field Experience Agreement form or the "Roles and Responsibilities" page) for the participants to reach while not leading them to it. As only one person successfully completed this task (and all of the other tasks were successfully completed by all participants), it is possible that our task prompt was confusing after all.

- Implications from the findings:
    - Participants navigated to “Research”, “Programs”, and “Careers” sections during the task. This could indicate that our participants did not unanimously agree on whether to categorize a field experience as pertaining to research, academics, or careers.
    - All participants viewed the “Registration” page, but two of them went back to the previous page rather than going deeper, which could imply that the requirements are not clearly stated on the “Registration” page.
    - None of our participants reached the other success page (“Roles and Responsibilities”), which provides detailed requirements for a field experience, implying that the label terminology is not descriptive.
    - The three participants who did not succeed in this task seemed uncertain if their end page fulfilled the task goals. P1 stopped at the “Registration” page; P2 viewed the “Registration” page, but went back to the “Field Experience” homepage; P3 viewed “Registration” and then the Field Experience Agreement form (the goal of the task) before returning to the “Field Experience” homepage. Clearly something was not understood by the participants during this task be it the confusing pages and subpages of “Field Experience” or the wording of our task prompt.

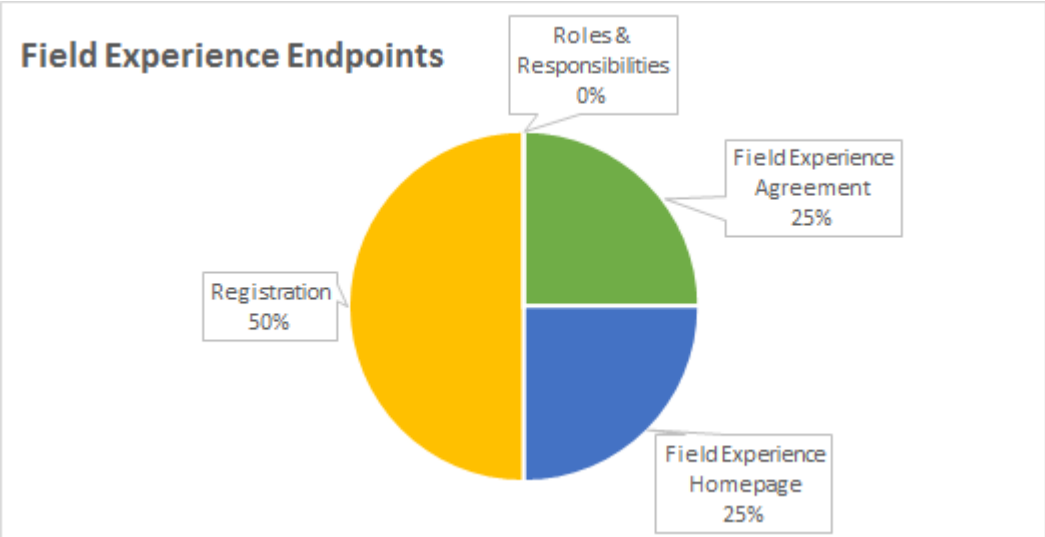


Figure 13. Endpoints of Field Experience Task

- Summary: this task appears to have been the most confusing task as the average time for completion was 115.25 seconds (the task with the highest average time is the advising task with an average of 117 seconds), only one of the four participants succeeded, and this task had the greatest amount of backtracking. The confusion could be due to an overwhelming amount of information on the website, poor site organization, or vague wording in the task prompt.

SILS Website Overall

- Time for task completion was measured as an indication of the ease of completing the task. Compared the average time taken for each task, the Specialization and Internship tasks were relatively easier than the Field Experience and Advising tasks. Some tasks may have been more difficult than others, but all of the tasks required at least 3 page visits for completion.

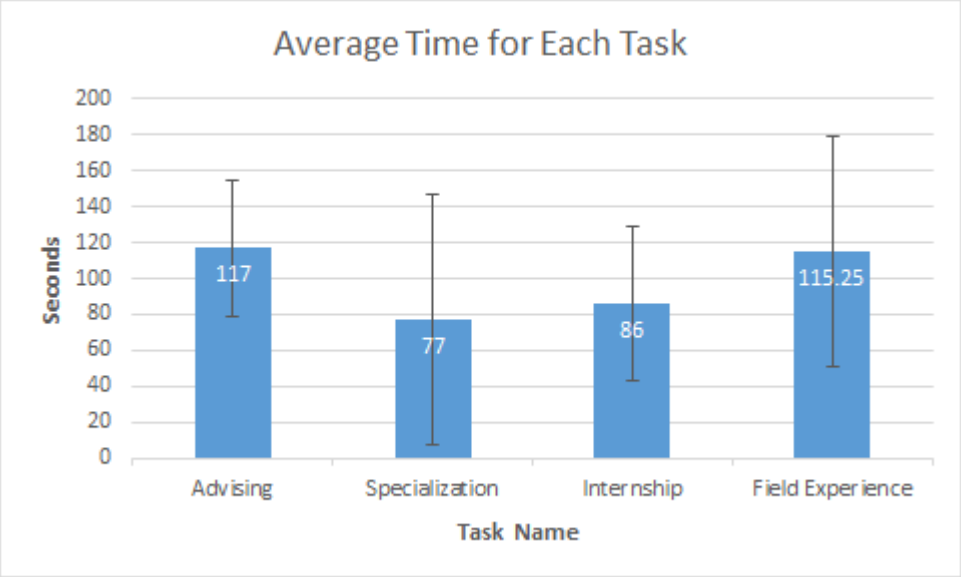


Figure 14. Average Time for Each Task (with 95% confidence interval)

- Participants' Self-Evaluation: Scores of Question 2 (I am satisfied with the ease of completing this task) and Question 3 (I am satisfied with the amount of time it took to complete this task) in Post-Task Questionnaires also reflected the ease of each task, from participants' perspectives. Advising was ranked as the least easy task, which was consistent with the time measurement. Moreover, we found that all participants rated question 4 (I would use the website to find information for or related to this task) higher than question 2 and 3, meaning that even when the participants did not think the site was easy to use or took a lot of time to complete the task, they would still use the site to get this information. We believe that the rating for question 4 was the highest for all of the Post-Task Questionnaires because the SILS website is the only resource for such information (outside of asking someone who works for the department).

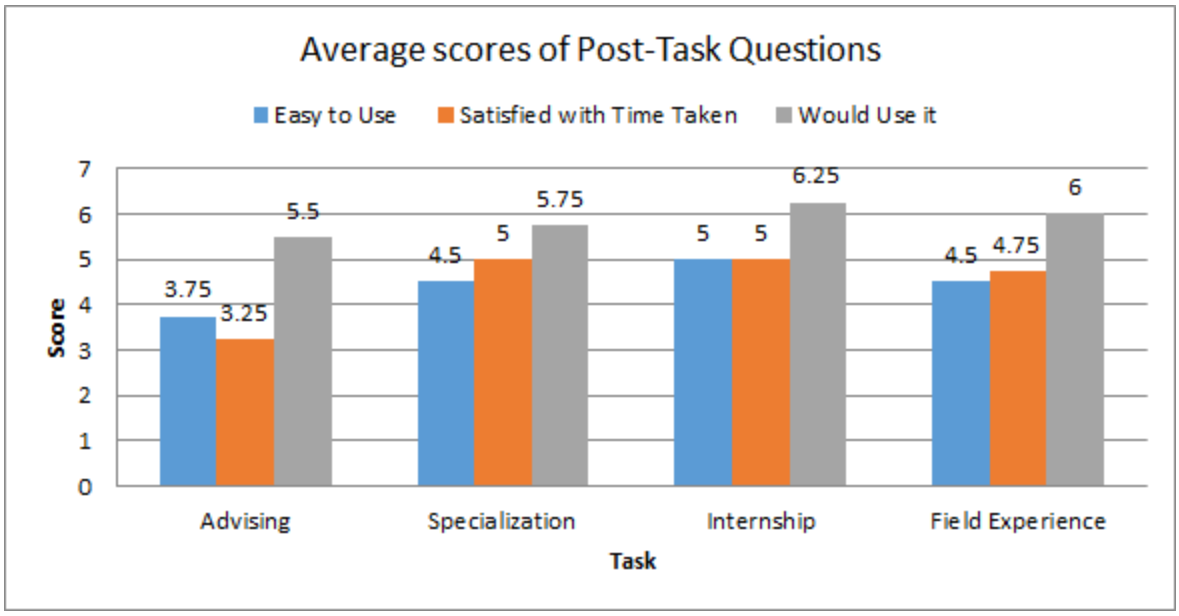


Figure 15. Average scores of Post-Task Questions (Overall)

- The search bar was shown to be useful, but users have to already know what queries to enter. For example, if you search “course planning” you get 6 pages of results and the first relevant result is the 8th result, whereas if you search “course planning worksheet” you get 2 results, both of which are relevant.
- The sidebar was found to be confusing, especially according to participant 4 who, when comparing the sidebars on two pages of the site, stated: “They are textually different but they look exactly the same, not sure if I’m going to careers or courses…. Careers or programs… they look the same.”
- The overall theme present in our findings and in the participants’ responses is that the SILS website has a lot of good information and many important functionalities, but it can be difficult to navigate and it is easy to get lost in the myriad of pages.
- SUS average across participants is 62.5 (standard deviation: 10.21), which is slightly lower than the cutoff score of lowest 25% (Banger, Kortum & Miller, 2009)[2], 62.6, meaning that the usability of SILS website is acceptable but with severe problems.

[2] Bangor, A., Kortum, P., & Miller, J. (2009). Determining what individual SUS scores mean: Adding an adjective rating scale. Journal of Usability Studies, 4(3), 114–123. https://doi.org/66.39.39.113

XII. Recommendations

1. Highlight useful functions

- This was also a participant suggestion: P4 said they did not know that there were internships listed on the SILS website until they say someone on that page, and asked them how to get to it. Thus, student internships and job postings in general could be emphasized as a function of the site.
- We also noticed this need to highlight useful functions. For example, we recommend placing more emphasis on “Current Students” because this part of the site was crucial to completing the Advising Task (through navigation and not by using the search function), but no participants clicked on it. We hypothesized that the layout of the “Current Students” link could be the issue - perhaps none of our participants clicked on this because it resembled a caption for the image it’s next to. However, we did not ask participants about this, and further studies would have to be done to investigate.

2. Simplify the information architecture

- Our most important recommendation is the simplification or reorganization of the underlying information architecture. All of our tasks were impacted by a lack of a clear path to the correct page, too many distracting similar pages, or categorization of features that did not align with participants’ expectations.
    - During the advising task, two participants searched for the Course Planning Worksheet in the “Programs” section of the site - it is only directly accessible via the “Forms” page or the “Advising” page, which are within the “Current Students” section of the site, not “Programs.”
    - For the specialization task, two of the participants explored the “Courses” section when looking for the courses one would take for a certain specialization. They remarked in the post-test interview that they found it confusing that specializations are not accessible via the “Courses” section of the site, even though specializations refer to specific courses.
    - When asked about the internship task, one participant told us: “It should be under the internships section, not the student jobs section.” The “Internships” page to which they refer directs students to sharing their internship experience, it does not direct students to internship positions that are available (which is the “Student Jobs” page).
    - The last task, field experience, had the highest percentage of backtracking out of all four tasks. The participants all located the “Field Experience” section of the site, but many appeared to get lost in the subpages of this section such as “Registration.” In fact, one participant

successfully navigated to the Field Experience Agreement form and then backtracked to “Registration” and then “Field Experience.”

- We suggest further investigation into reorganizing the categories of the site using some form of card sorting study because it would provide user-centered feedback from actual users of the site.

3. Improve the search function

- While we did not originally have the search bar in scope for this project, all four participants successfully completed the advising task using the search bar, leading us to believe that it is more important than we initially realized.
- One participant in particular reflected on the search bar of the site, stating that a search function is particularly useful for international students, however they found the search box on the SILS website to need improvements. For example, the search does not provide query suggestions, so it is only helpful if the user searching already knows the exact keywords they need to use. Additionally, the relevancy ranking of the results page is not easily understood - in the case of searching for “course planning,” we found that the first relevant result was listed 8th.

4. Systematize the sidebar

- Most of the site navigation was conducted using the sidebar, and multiple participants had issues with the layout and/or organization of the sidebar. Thus, the overall navigability of the site could be improved by further investigation into better ways to structure the sidebar.
    - P2 during the internship task found that there were various labels at multiple levels in the hierarchy pertaining to jobs and internships, which they found difficult to navigate. This involved the sidebar of the “Careers” section of the website specifically.
    - P4, when reflecting on the site as a whole, remarked that they found the sidebar confusing because across pages the sidebars “are textually different but they look exactly the same,” illustrating that this user would prefer sidebar consistency across the site.
- We suggest that one way to improve the sidebar would be to have it contain a series of interactive drop down menus, so that the user can explore the hierarchy without having to actually navigate to other pages. Again, this should be explored through further inquiry.

5. Update the overall appearance and layout

- The general impression we got from the participants was that the site contained everything they needed to find, but the site was not arranged to facilitate finding the information nor was it a particularly appealing site in terms of appearance. Participant 1 described the site as looking “old.”

XIII. Reflection

As this usability study was for academic purposes, our team decided to rotate the team member roles for each testing session so that we all could experience each one. However, we recognize that it is not recommended to have more than two moderators in an actual usability test because the moderator has a great effect on the testing session. The most important goal for a usability test during the testing phase should be consistency between each testing session - aside from rotating the roles, we made a concerted effort to do so using our moderator guide and script.

One of our most intriguing findings was how none of the participants used the “Current Students” route to delve into the site. However, we did not ask the participants if they noticed this section of the homepage or why they did not use this path. As such, we can only speculate as to why it was not used, so further research could be conducted to figure it out.

For the internship task, we changed the definition of success once we saw that the participants did not click on specific postings because the participants’ performance led us to believe that the prompt may have impacted the results for this task. If we were to run this usability test again, we would most likely reword the prompt to say something along the lines of “select an internship” so that it is more clear what we are expecting from the end result.

Our main evaluation goal for this usability test was to examine the underlying organization of the site and thus its navigability for users familiar with the site. We chose four tasks that exemplified organizational issues:

- Can a student find/download the MSIS course planning worksheet? Yes, our participants could find and download this worksheet, but they all needed to use the search box in order to do so.
- Can users find information about the degree program and/or specialization they are interested in? Yes, our participants were able to find the MSIS specializations either very quickly or with considerable effort.
- Are students able to find student internship listings on the website? Yes, our participants were able to find the student jobs listings, however they did not investigate specific positions, instead stating that they were done once at the “Student Jobs” page. Additionally, one participant pointed out that there are multiple pages with job postings-related information, and this lead to confusion for them.
- Are users able to locate the requirements that need to be fulfilled before they start a field experience? No, our participants were not able to find the requirements to begin a field experience, however this could be due to multiple factors: the categorization of field experiences on the site (as a “Career” and not a “Course” or “Research”), confusion over what we were asking for in our task

prompt, and/or misunderstanding the purpose of the many “Field Experience” subpages (“Roles and Responsibilities,” “Deliverables,” etc).

While we learned a lot through testing, it is interesting that some of the problems we identified in earlier stages of our project were less apparent. For example, our cognitive walkthrough made it very clear that the website often presents users with bad alternative links but test participants did not express this issue as explicitly. Similarly, we noticed lots of unexpected quirks in the site over the course of this project but our participants lacked that level of knowledge about the site and therefore did not realize these issues or could not articulate them in the same manner that the team could.

XIV. Appendices

Appendix A: Moderator Guide

Introductory Script:
"Hello, my name is _____. Thank you for taking the time to participate in our study. We are testing the usability of the SILS website and your input is extremely valuable.

Let's start by going over what we'll be doing today. I'll be the moderator for this test so I will be sticking with a script to ensure every participant has the same experience. _____ will be observing and taking notes. In just a minute, I'll ask you to complete four tasks on the SILS website. As you likely already know, the SILS website is a central hub for the School of Information and Library Science where people can learn about SILS events, faculty, research, courses, and degree programs, among other topics.

We'll start with a brief demographic survey, then I will give you a set of four tasks to complete. After you finish each task I will give you a short questionnaire. After at all the tasks, you will complete a more general questionnaire and I'll ask you some questions about your overall experience.

Before we begin, we need to make sure that you consent to participating in this study.

Your participation in this study is completely voluntary. You may end your participation at any time for any reason.

With your permission, we will be recording the computer screen while you are completing the study. We will also be audio recording. These recordings are solely for our research team to use during data analysis for a class project. We will never share this data. Here is the consent form. Please take a moment to read over it before you sign it. Please let me know if you have any questions or concerns.

Give the participant a consent form and give them plenty of time to sign it. Should they decline, inform them that the study cannot proceed without their consent.

Thanks again for agreeing to participate in this study. Before we start our tasks, do you have any questions?

OK, we're going to start with a brief survey about your background.

Give the participant a background survey.

Great! Now let's begin the tasks. In front of you is a computer with the SILS website open on it. You will use this for all of your tasks. When you feel you have completed each task, just let us know you are done by telling us that you have completed the task. At the end of each task, we'll reset the browser to the SILS homepage.

Here's Task 1

Note- the task scripts may be presented in a different order for each participant. This is to counterbalance any order effects.

Script for Advising Task:
"Imagine that you have just finished meeting with your advisor to discuss plans for which courses you would like to take in the upcoming semesters. While the discussion was somewhat fruitful, your advisor has suggested that you print and fill out the MSIS course planning worksheet, which lets you write down and organize which elective courses you want to take, as well as when you plan to take each course in the MSIS curriculum. Having navigated to the SILS website, your task is to find and open this MSIS course planning worksheet."

Wait for the participant to complete task.

OK, now I'd like you to complete this short set of questions about this task:

Give the participant the post-task survey.

Thank you. Here is your next task.

***Script for Specialization Task*:**
"Imagine that you have just come out of a fascinating presentation about a cutting-edge database technology, and now want to focus your MSIS studies on database design. You go to the SILS website with the intent of finding out what courses are recommended for a student with your interests."

Wait for the participant to complete task.

Alright, now I have another short set of questions for you.

Give the participant the post-task survey.

Thank you. Here is your next task.

Script for Internship Task:
"Imagine that you are outlining your future semesters in SILS, and decide you want to pursue an internship next semester. Your task is to use the SILS website to locate a description for a currently-available student internship."

Wait for the participant to complete task.

Next I have another short survey about that last task for you.

Give the participant the post-task survey.

Thank you. Here is the last task.

Script for Field Experience Task:

“Imagine you are thinking about doing a field experience and need to investigate what you would need to do to register for one. Use the SILS website to locate the requirements that need to be fulfilled before you start a field experience.”

Wait for the participant to complete task.

OK, one more short survey about the task you just completed.

Give the participant the post-task survey

Thank you. Alright, that concludes our tasks. Now I’d like for you to fill out this questionnaire about your overall experience today.

Give the participant the post-test questionnaire.

Great! Now I have a few open-ended questions for you.

Post-test semi-structured interview script:
“What is your overall opinion of the SILS website?”
“Have you had any issues using the SILS website?”
If participant answers yes, then follow up with: “How did you solve the issue?”
“Is there anything you would change about the site?”
“Do you have any additional questions or comments about the SILS website or this usability test?”

That concludes the test. Thank you so much for participating. Before you go, do you have any questions for me?

Appendix B: Testing Materials

All testing materials that will be presented to the participant will be printed on separate sheets of paper and given to the participant one at a time. For the sake of conserving paper, most testing materials for the participants will be on half sheets of paper. The note-taker will use a separate sheet of paper for each of the tasks completed by each participant. Testing materials included here are as follows:

A. Participant Background Information Survey
B. Participant Task Prompts
    i. Course Planning Task Prompt
    ii. Database Task Prompt
    iii. Internship Task Prompt
    iv. Field Experience Task Prompt
C. Participant Post-Task Questionnaire
D. Participant Post-Test Questionnaire
E. Note-Taker Task Note-Taking Guide
F. Note-Taker Post-Test Interview Note-Taking Guide

Participant Background Information Survey

Participant Number: _____

Degree Program: _____

Year in degree program: _____

How often do you use the SILS website? *Circle an option below.*

Never						*Every day*
1	2	3	4	5	6	7

If you do use the SILS website, which sections of the site do you use most often? *Explain below.*

Course Planning Task Prompt

Imagine that you have just finished meeting with your advisor to discuss plans for which courses you would like to take in the upcoming semesters. While the discussion was somewhat fruitful, your advisor has suggested that you print and fill out the MSIS course planning worksheet, which lets you write down and organize which elective courses you want to take, as well as when you plan to take each course in the MSIS curriculum. Having navigated to the SILS website, your task is to find and open this MSIS course planning worksheet.

Database Task Prompt

Imagine that you have just come out of a fascinating presentation about a cutting-edge database technology, and now want to focus your MSIS studies on database design. You go to the SILS website with the intent of finding out what courses are recommended for a student with your interests.

Internship Task Prompt

Imagine that you are outlining your future semesters in SILS, and decide you want to pursue an internship next semester. Your task is to use the SILS website to locate a description for a currently-available student internship.

Field Experience Task Prompt

Imagine you are thinking about doing a field experience and need to investigate what you would need to do to register for one. Use the SILS website to locate the requirements that need to be fulfilled before you start a field experience.

Post-Task Questionnaire

Task:____
Participant: ____

1. Was this a task that you were familiar with or have completed before?
Circle one: **YES** **NO** **N/A**

2. Overall, I am satisfied with the ease of completing this task.

Strongly disagree						*Strongly agree*
1	2	3	4	5	6	7

3. Overall, I am satisfied with the amount of time it took to complete this task.

Strongly disagree						*Strongly agree*
1	2	3	4	5	6	7

4. Overall, I would use the website to find information for or related to this task.

Strongly disagree						*Strongly agree*
1	2	3	4	5	6	7

Post-Test Questionnaire

System Usability Scale

	Strongly disagree				Strongly agree
1. I think that I would like to use this system frequently	1	2	3	4	5
2. I found the system unnecessarily complex	1	2	3	4	5
3. I thought the system was easy to use	1	2	3	4	5
4. I think that I would need the support of a technical person to be able to use this system	1	2	3	4	5
5. I found the various functions in this system were well integrated	1	2	3	4	5
6. I thought there was too much inconsistency in this system	1	2	3	4	5
7. I would imagine that most people would learn to use this system very quickly	1	2	3	4	5
8. I found the system very cumbersome to use	1	2	3	4	5
9. I felt very confident using the system	1	2	3	4	5
10. I needed to learn a lot of things before I could get going with this system	1	2	3	4	5

Note-Taker Task Note-Taking Guide

Note-Taker: _____

Participant: _____
Task: _____

Total number of clicks:
Total number of backtracks:

Other notes:

Note-Taker Post-Test Interview Note-Taking Guide

Note-Taker: _____

Participant: _____
Task: _____

"What is your overall opinion of the SILS website?"

"Have you had any issues using the SILS website?"

> If participant answers yes, then follow up with: "How did you solve the issue?"

"Is there anything you would change about the site?"

"Do you have any additional questions or comments about the SILS website or this usability test?"

Appendix C: Questionnaire Data

Pre-test Questionnaire

Participant ID	Degree Program	Year in Degree Program	How often do you use the SILS Website? (1 to 7)	If you do use the SILS website, which sections of the site do you use most often?
1	MSIS	1	1	
2	MSIS	1	3	SILS courses. It helps for selecting courses and making plans especially when it's time to get enrolled for next semester
3	BS	4	1	
4	MSIS	1	4	Courses, faculty

Post-task Questionnaires

Advising Task

Participant ID	Was this a task that you were familiar with or have completed before?	Overall, I am satisfied with the ease of completing this task.	Overall, I am satisfied with the amount of time it took to complete this task.	Overall, I would use the website to find information for or related to this task.
1	no	2	2	6
2	(blank)	4	5	6
3	no	4	3	6
4	n/a	5	3	4

Specialization Task

Participant ID	Was this a task that you were familiar with or have completed before?	Overall, I am satisfied with the ease of completing this task.	Overall, I am satisfied with the amount of time it took to complete this task.	Overall, I would use the website to find information for or related to this task.
1	yes	6	6	6
2	no	4	4	7
3	no	4	5	6
4	yes	4	5	4

Internship Task

Participant ID	Was this a task that you were familiar with or have completed before?	Overall, I am satisfied with the ease of completing this task.	Overall, I am satisfied with the amount of time it took to complete this task.	Overall, I would use the website to find information for or related to this task.
1	no	3	3	6
2	yes	6	6	7
3	no	4	4	6
4	yes	7	7	6

Field Experience Task

Participant ID	Was this a task that you were familiar with or have completed before?	Overall, I am satisfied with the ease of completing this task.	Overall, I am satisfied with the amount of time it took to complete this task.	Overall, I would use the website to find information for or related to this task.
1	yes	5	6	6
2	no	6	5	7
3	no	3	3	6
4	no	4	5	5

Post-Test Questionnaire (System Usability Scale)

Participant ID	1	2	3	4
I think that I would like to use this system frequently	5	5	2	4
I found the system unnecessarily complex	4	4	2	4
I thought the system was easy to use	4	4	4	4
I think that I would need the support of a technical person to be able to use this system	1	2	1	2
I found the various functions in this system were well integrated	3	4	3	2
I thought there was too much inconsistency in this system	3	3	2	3
I would imagine that most people would learn to use this system very quickly	3	4	3	4
I found the system very cumbersome to use	2	3	1	4
I felt very confident using the system	3	3	3	3
I needed to learn a lot of things before I could get going with this system	1	2	1	5
SUS Score	67.5	65	70	47.5

Appendix D: Task Performance Metrics

Advising Task

Participant ID	Task Success (1 = yes, 0 = no)	Time on Task (seconds)	Pageviews	Backtracks	Backtrack Ratio
1	1	157	14	4	0.2857142857
2	1	96	5	0	0
3	1	74	5	0	0
4	1	136	9	1	0.1111111111

Specializations Task

Participant ID	Task Success (1 = yes, 0 = no)	Time on Task (seconds)	Pageviews	Backtracks	Backtrack Ratio
1	1	20	4	0	0
2	1	137	15	3	0.2
3	1	140	6	0	0
4	1	11	3	0	0

Internship Task

Participant ID	Task Success (1 = yes, 0 = no)	Time on Task	Pageviews	Backtracks	Backtrack Ratio
1	1	105	8	0	0
2	1	76	7	1	0.1428571429
3	1	133	7	0	0
4	1	30	2	0	0

Field Experience Task

Participant ID	Task Success (1 = yes, 0 = no)	Time on Task	Pageviews	Backtracks	Backtrack Ratio
1	0	46	3	0	0
2	0	110	5	1	0.2
3	0	204	10	3	0.3
4	1	101	6	1	0.1666666667

Appendix E: Task Order and Role Rotation

Task Order

Participant ID	First Task	Second Task	Third Task	Fourth Task
1	Task #1	Task #2	Task #3	Task #4
2	Task #4	Task #3	Task #2	Task #1
3	Task #2	Task #4	Task #1	Task #3
4	Task #3	Task #1	Task #4	Task #2

For this chart: Task #1 = Advising Task, Task #2 = Specialization Task, Task #3 = Internship Task, Task #4 = Field Experience Task

Role Rotation

Participant ID	Moderator	Note-taker	Tech Support	Absent
1	Gordon	Lauren	Andi	Samantha
2	Andi	Samantha	Gordon	Lauren
3	Lauren	Andi	Samantha	Gordon
4	Samantha	Gordon	Lauren	Andi