Creating a Micro UX Internship with Artifacts and Impact

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abstract: User experience (UX) internships generate ideas for usability projects, improve the design of existing and new services, investigate users' motivations and behavior, and build transferable skills for interns. This case study proposes a micro-internship model, grounded in the design cycle, that institutions can adapt to address their libraries and students' needs. The model employs a three-stage process—discover, understand, and create—and it also provides best practices on structure, engagement, resource selection, and skill acquisition with usability methods. The article includes three case studies of UX undergraduate intern projects completed in two weeks or less using a mini-portfolio format.

Introduction

Hollins University is a small liberal arts college in southwest Virginia with an FTE of approximately 700 undergraduate students and 150 graduate students. Students are encouraged to participate in internships, but only certain majors require them. The university internship program began in the 1970s, and the library began offering a January (J-Term) internship in 2018, which is non-paid and carries 4 academic credits. J-Term library interns gain experience in different areas of library service and have the option to learn about user experience (UX). Small institutions such as Hollins University do not have UX departments, and this growing field presented an internship opportunity for the Hollins University Library to engage with students in a high-demand field while enhancing the library's services from a UX perspective. Moreover, a UX internship helps libraries stay connected to users' preferences, provides a space for interns to learn, practice, and apply new skills to tangible projects, and distinguishes the library as a responsive and user-oriented department on campus. UX internships can also appeal to students who are not interested in pursuing a career in libraries, but still want to gain career readiness skills. The skills acquired during a UX internship demonstrate the library's role in developing job readiness and transferable skills within the academy. This case study provides a structure and framework for a

UX internship and showcases specific interns' projects. This article aims to inspire UX internship creation and practice.

Libraries as training ground

Academic libraries are a useful training ground for internships, specifically UX internships, because they operate in a professional world with limitations and constraints (financial, staffing, software). Due to these constraints, an intern can practice critical thinking when designing solutions or programs to address a library service or initiative. UX internships also benefit libraries by leveraging students' perspectives and experiences. A library internship can uniquely position a student to occupy two complementary roles. First, the intern embodies a student's perspective because they experience the university, classes, and the library as a student. They possess the tendencies, experiences, patterns, and habits of students. During the internship, they become library insiders through training and knowledge of library systems. They become part of a campus department attempting to design usable and findable services. Interns illuminate students' needs and expectations to librarians, ideally by gathering information via ethnographic methods such as interviews and surveys.

Timothy Sestrick and Lina Terjesen explain that "a student intern will have the experience of relating to other students as information seekers rather than as friends or classmates."[1] Undergraduate UX interns can, for example, unearth problems with third party vendor interfaces, identify confusing jargon, and serve as a bridge to their peers so librarians learn how students use library services.

Literature Review

This literature review provides an overview of the effective ingredients of undergraduate library internships and mentions productive practices and structure. Themes of engagement, passion, autonomy, and structure emerge.

Engagement

Many studies mention engagement as a critical feature of internships. Geraldine Hardie, Shamika Almeida, and Pauline J. Ross argue that engagement, critical reflection, real-life work experiences, and an optimal balance between support and challenge are ingredients for successful internships.[2] Creating an engaging environment includes creating challenging projects, but it also means developing a relationship of open communication between the interns and the supervisor. Kaitlyn Breiner posits that creating an atmosphere of engagement requires the intern's involvement in setting project goals and collecting intern feedback about their experience to improve future internships.[3] Setting goals requires the intern to engage in reflection, which is another valuable ingredient for an internship. Using a student's reflections, ideas, and interests is beneficial to the organization. Timothy Sestrick and Lina Terjesen build engaging internships by customizing projects to interns' interests, creating a theoretical base with reading and research, and preparing them for practical work with "concrete outcomes" they can include on resumes.[4] Allowing interns some latitude in choosing their projects is another theme

across the literature. Tricia Lantzy and Talitha Matlin developed a bank of internship assignments and activities dealing with science and health majors but also provided options for the interns to learn about research tools specific to their major or discipline.[5] Mary A. King and H. Frederick Sweitzer value engagement so highly that it is described as an important approach, process, and learning outcome.[6] To avoid disengagement Jennifer Nutefall recommends having a list of projects in mind for an intern, thus avoiding "busywork."[7] Hannah Arata builds engagement opportunities by encouraging interns to share their passions so they can be matched up with a passion-related project and be given autonomy to plan their own programs.[8] The concept of "taking ownership" is also linked to engagement.

Michelle Twait further documents how a library and marketing internship empowers students to take ownership of projects, design data collection and analysis, assess programs, and present their findings to an audience outside of the library.[9] Laying the groundwork for engagement and empowerment requires clear communication about the internship before it starts.

Structure

There is a small body of literature about designing and structuring library internships. Pre-internship communication and meetings play a large role. To ensure the intern and the supervisor are on the same page before the internship begins, Nutefalle recommends writing an internship job description, setting up a pre-internship interview, and having a list of projects.[10] Pre-internship meetings and planning help customize projects for an intern.

For libraries creating internships, Candice Dahl recommends using pre-existing outcomes and evaluations established by the university for course credit internships, suggesting interns spend half of their time learning and the other half working on projects. It is also important for supervisors to provide feedback and assistance as interns work through projects, concluding the experience with a supervisor's evaluation of the intern's contributions.[11]

Rebecca Blakiston uses design thinking in a novel way, not only to structure the internship, but to initially understand graduate student interns' attributes such as goals, behaviors, and constraints, and she uses those findings to match an intern with an appropriate project.[12] Sarah Gibbons writes about design thinking as a structure with three iterative stages: understand, explore, and materialize.[13] Blakiston uses this framework to divide graduate student internships into stages.[14] In the *understand* stage, a practitioner conducts and combines existing research to define a problem. In the *explore* stage, a practitioner generates ideas and prototypes to represent those ideas. In the *materialize* stage, the practitioner tests and adjusts their prototypes based on the results and finally implements their design changes, services, or product.

Intern Projects

The survey of the literature did not reveal articles dealing specifically with undergraduate internships focused on user experience or displaying their finished projects. Outside of the literature, Swarthmore College Libraries has a blog (see https://libraries-aux.

swarthmore.edu/) listing the activities of their student UX team, which includes us-ability testing, focus groups, and other methods. There is a gap in the literature dealing with undergraduate user experience internships in academic libraries, their potential, and their proof of concept in the form of completed projects.

This case study is novel because it provides completed projects and artifacts of in-terns' work to help internship supervisors see the process and promise of student-driven work. This article supplies the structure, time frame, and recommendations for a UX internship. The article also shares practical approaches that are easily adaptable and can assist others in developing their own UX internship with limited time and resources.

A micro-internship

This article covers the user experience component of the full library internship, which lasts around two weeks or less and is therefore considered a "micro-internship." Jason Wingard explains that micro-internships, which focus more on building skills by com-pleting specific projects, often remotely, have emerged as a more equitable alternative to the traditional internship model.[15] Parker Dewey defines them as "short-term, paid, professional assignments that enable Career Launchers to demonstrate skills, explore career paths, and build their networks. They can take place year-round, typically require 10 to 40 hours of work by the student and are due within a few days to a few weeks."[16] The Hollins library UX internship is comprised of 35 hours of work per week—7 hours per day for 1 to 2 weeks—non-paid and its shorter length and project-based focus aligns with the concept of a micro-internship.

Developing the Internship

To learn about the effectiveness of the internship structure, intern enjoyment, and en-gagement, this case study employed reflection journals for the first two interns in 2018 and 2019.

The 2018 and 2019 internships were structured differently from later ones, focusing more on scholarly articles about usability in libraries. For example, these interns selected two scholarly articles about usability in academic libraries and identified trends. This approach was not effective for engagement or creating projects specific to the Hollins University library. The articles the interns selected addressed topics that were often unrelated and did not apply to usability issues that impacted the Hollins University community. The interns summarized the articles and explained how the authors decided what sections or services to test or improve. While the interns learned usability vocabu-lary and felt more comfortable navigating scholarly articles after these assignments, they also spent less time learning about usability problems affecting their community or exploring their interests. Interns completed journals or questionnaires at the end of the internship. Prompts for journals included:

- What did you learn today?
- What did you enjoy today?
- What aspects of the work you did today were significant? Why?
- What was the best thing that happened during your internship?

- How structured / guided was your time? How effective (or ineffective) does that make you?
- How did your experience shape your perception of the work libraries do?
- Based on your observations, how would you describe the culture of the library?
- In what ways did you see connections between the library and the university community? Do you see any missed opportunities for connection?
- What surprised you about your internship?

Two interns from the 2018-19 group reported feeling "bogged down" by new vocabulary and jargon and found reading the peer-reviewed articles "tedious."

Aside from reviewing scholarly journals, these earlier internships included analytics analysis of Hollins University library data and usability testing in our community. However, the process of generating tasks for usability testing was primarily prescribed by the librarians and did not encourage interns to create their own tasks based on their observations or interests. During this time, interns usually received a list of potential issues to turn into usability tasks, so the process was mainly prearranged. For instance, if library staff wondered whether students knew how to access help from the discovery system, then the intern would include a task addressing this issue.

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Compared to more recent internships, the 2018 and 2019 interns did not practice using methods more than once, conduct field work as often with Hollins students, or use multiple methods to explore unknown usability issues. The shortcomings of the internships were apparent when the internship supervisor reported similar findings two years in a row. It was clear that the internship was not encouraging the unique interests or sensibilities of the interns, building engagement, or giving them the space to ask more fundamental questions about how the community uses the library.

It was time to move away from the prescriptive format of the internship and find alternatives to scholarly journal articles as tools for teaching interns about usability. Replacing the scholarly articles with more actionable resources, such as videos and short how-to guides for UX practitioners, meant interns had more time. They used the time to craft, critique, and practice their usability methods before doing fieldwork. Later interns were encouraged to take deeper dives into each method to become familiar with more advanced techniques, such as facilitating "thinking out loud" during usability testing or building rapport and asking dialogue-provoking questions during interviews.

Alongside an emphasis on methods and practice, the later internship model strived to discover and develop the interns' specific interests, whether they were boosting awareness of a section of the collection or improving the findability of specific resources or web pages. As mentioned in the literature review, tapping into an intern's interests was a necessary ingredient for building autonomy and giving the intern space to own a

project. Learning and practicing a usability method with the intent to apply it to explore a personal interest generates a different level of engagement when compared to learning a method to apply to a prescribed agenda. As personalization became a more prominent emphasis in the internship there was a marked difference in each subsequent internship. Each year became more distinct, investigating a unique theme producing reports and recommendations with a different look and feel. Having removed the prescriptive reporting and project requirements, the interns were allowed to communicate their findings in their own way, discussed further Intern Work section.

Procedure

Laying the Groundwork for Engagement and Empowerment

Learning about an intern's experiences and interests can spark a project idea that fits their interests and strengths. Hollins University library's internship program attempts to provide a variety of subject areas, including collection development, event planning, archives, metadata, and user experience. Librarians or library staff volunteer as internship supervisors and create content related to their area. An outreach librarian, for example, would provide an intern with resources and guidance on organizing an event, while an archivist might train an intern on a digitization project. The library typically hosts 1to 3 interns per J-term. The internship supervisors meet before the internship begins to brainstorm project ideas and approaches to the internship.

At the first meeting, the internship supervisors provide the intern with a list of potential projects.

Having a list of substantial UX projects for interns to choose from helps avoid potential busywork an intern might experience and can also increase intern engagement. Brainstorming potential projects is essential, and these prompts can help to generate ideas:

- What new or existing service, database, or interface needs user testing or feedback?
- What kinds of questions have library employees received about using the library?
- Are there databases, tools, or services that are not well-known, but the librarians perceive them as useful to students?

These project questions are general enough to apply to any type or size of library. Aside from librarian-generated ideas, supervisors should try to get to know the intern and their interests. To allow an intern the opportunity to create their project, use open-ended interview questions, encouraging them to talk about their ideas. Giving an intern space in the interview led the 2022 J-Term intern to talk about their excitement about the Young Adult New Adult fiction collection.

Avoiding Busywork

Aside from specific projects focusing on interfaces, services, or other tools, keep a list of perennial projects. These projects can be presented as backup ideas, which are more general and applicable to any library with a website and help to improve the UX of a site or pages. These include:

- Accessibility audit (use a browser extension to check accessibility issues)
- Language audit (reviewing web pages for confusing library jargon)
- Web writing audit (is content easy to scan? does it have clear headings and sub-headings?)
- Card sorting/Information architecture (do website categories and pages make sense to users?)

Aside from user experience these projects include areas of collection development, event planning, or archive work. The intern is briefed on the nature of each type of work with a recap of past projects in each area. The intern then ranks the area and projects by their level of interest. Interns can use their interests to create projects in one of the internship areas, subject to the supervisor's approval. Since 2018, 50 percent of library interns have shown interest in, and participated in, a UX project. The interns' majors included: English, political science, psychology, creative writing, and theatre. The intern cover letters frequently mentioned their love of library spaces, fiction, or their experience working in libraries or bookstores, and planning events. A few interns were interested in pursuing a career in libraries post-graduation. When expectations for the internship were included in cover letters, they were general, mentioning building knowledge and skills in communication and organization as well as learning the inner workings of a library.

Structure: Building Autonomy and Ownership

The UX internship is built on UX readings and resources, intern reflection and practice of methods, and finally intern fieldwork. At the start of the UX internship, the supervisor meets with the intern daily, usually in the morning, to explain the readings and their purpose, and answer any questions. As the internship progresses and work begins on a project, a supervisor may occasionally meet with an intern at the end of the day to discuss their progress and goals and address questions. Other days a simple email check-in suffices.

Trust and expertise are at the core of giving the reins over to the intern. In theory, the supervisor provides the intern with the tools and practices needed to succeed and grants them autonomy to complete the project without micro-management. The intern is encouraged to take ownership of a project and develop their approach. Engagement can come from a sense of purpose. Purpose might take the form of:

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- Impact: improving services so future students can benefit
- Creativity: bringing the intern's distinctive interests to a design problem
- Values: taking a deep dive into a service or area of the library that resonates with them

Internship stages

The macrostructure of the internship follows the three-stage design thinking model mentioned in the literature review but uses different terminology. The stages for this internship model are *discovery*, *understanding*, and *creating* (see Table 1).

Table 1.
Internship stages

Stage 1 – DISCOVERY *via analytics and other data*	Stage 2 – UNDERSTANDING *through human skills*	Stage 3 – CREATING *based on findings*
Discover library users' patterns and preferences for usage.	Interns will learn and use methods to explore the "**WHY**" and learn the strengths and weaknesses of each method.	Interns will create: Prototypes or design ideas to address pain points Reports with recommendations

Introduction to UX

The first day of the internship introduces usability concepts and asks the intern to reflect on their time using technology or services on campus. After the intern writes about their positive and negative experiences on campus, they are prompted to suggest concepts or techniques from the readings that could be applied to address their negative experience. There is a separate prompt about sharing an interaction with a software or service that was satisfying and asks the individual to identify user experience concepts that helped create this satisfaction. These prompts help them build a bridge between their lived experiences and the concepts from the articles. It also primes the interns for an approach to improving services and interfaces that is more nuanced than simply designating a service as "user-friendly" or "not user-friendly."

Stage One: Discovery User Activity

On their second day of work, an intern receives analytics and usage data such as heat map images from the library website homepage, Google analytics for the site, and chat reference transcripts that might show trends or patterns in questions. Readings accompany this data to make it easier to understand. This stage gives the intern a mile-high view of the web activity, the questions asked, and the most popular pages. The goal for this stage is that the intern is able to answer the question "what are library users doing on the website?" The methods employed in this stage focus on reviewing analytics and usage data. This stage builds empathy and understanding for library users because certain forms of data such as chat reference transcripts briefly show the person's story, where they struggle, and can highlight confusing tasks. For instance, a chat reference transcript may show a trend of individuals not knowing how to use interlibrary loan to request items their home library does not hold. Viewing this data can provide insights —"Wow, no one knows about interlibrary loan!"—and help the intern generate ideas that can become a tasks in a usability test or questions in an interview during stage two

of the internship. The *discovery* stage builds awareness of what library users do, seek, and ask for help with, but it does not explore the user's motivations.

Stage Two: Understanding

On the third day of their experience, interns delve into understanding library users' motivations by building empathy and communication skills, known as human skills. Understanding human motivation requires listening, perspective-taking, and striving to understand another's lived experience. Human skills, as Abbey Lewis states, "constitute our ability to relate to one another and refer to aspects such as empathy, compassion, and authenticity."[17] The purpose of this stage in the internship is to build human skills by practicing and learning usability methods. These mostly qualitative methods differ greatly from the process of interpreting analytics in the *discovery* stage. In the *understanding* stage, interns employ different methods to actively engage with actual library users.

The goal for this stage is that the intern understand one to two usability methods, which they then employ to test a service or interface. Introducing these methods follows a similar pattern of reading and reflection, but the reflection focuses on best practices for each method. The reflections and readings address the dos and don'ts of each method, and interns draft questions or tasks for their fieldwork that they then self-critique, using concepts from the readings. After the critique, the internship supervisor also provides feedback. This stage of reading, reflection, critique, and feedback for each method usually takes one day.

The internship supervisor presents usability methods as human skills that take time to develop. Methods, such as interviewing, are not simple tasks. They are skill-based, and the process is more like learning a musical instrument or foreign language; a practitioner improves the more they engage in the activity. The methods are not simple, and interns learn about what can go wrong with them. Interns are encouraged to be deliberate, spending more time on fewer tasks and questions. As a best practice, interns are encouraged to conduct dry runs and test the content they create for each method. For instance, interns are encouraged to practice a short set of usability test tasks with library student workers, so they can develop their pitch for the project and become comfortable facilitating a usability test. Moreover, when structuring the size and scope of a survey, the quality and crafting of each question are emphasized over quantity. A shorter list of tasks or questions that are well-formulated and focused fits with the skill level of the intern as well as the shorter time frame of the internship.

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Practicing in Stage Two

The resources, prompts, and discussions with the internship supervisor during the *understanding* stage emphasize the importance of refining the intern-created content for

each method before engaging with users. Interns think about and test the content in each method as much as time permits before using the methods to collect data on a project. There is a strong emphasis on practicing each method and critiquing it in this stage. A draft example of a usability task from a 2022 intern read, "Find the page where you can schedule an appointment with a librarian." A critique shows that this task lacks specificity and does not read like an actual task a student might do. It also does not clarify where a student begins this task. A revised intern draft reads, "You have a research assignment in your economics class, and you need to make an appointment with a librarian to help you find sources. Starting from the homepage, show where you can schedule an appointment with a librarian that can help you with economics."

Interns learn about one method at a time, and the methods in this stage collect data using interviews, usability tests, and card sorting. After collecting and analyzing data, they learn about a different method and the sequence repeats itself. These methods are used in concert to learn how library users experience a single service or interface. The *understanding* stage resembles the define stage of the design cycle because interns will use methods to learn more about users so they can more clearly define a problem. During a two-week internship, two methods are likely the maximum number an intern can practice, test, and then perform. Using methods such as interviews, usability testing, or card sorting to better understand users' behavior and preferences connects to stage three, which is creating recommendations. At the conclusion of stage two an intern should have a sense of users' motivations, what confuses them, where they struggle, and ideally have ideas for solutions, which can be design or communication solutions shared by participants or generated by the intern. The intern is now in the position to generate recommendations in the next stage.

Stage Three: Creating Recommendations, Reports, and More

The last two days or so of the internship are the *creating* stage, which emphasizes problem-solving, creativity, and generating ideas for subsequent interns. In the *creating* stage an intern's goal is to analyze the data they collected, which includes summarizing trends and offering recommendations.

The findings for each method require a different genre of communication. A usability test analysis, for example, requires a summary of performance on each task, a severity scale, and recommendations to improve usability. A severity scale determines the impact size a usability problem poses.[18] When interns list a usability problem on the severity scale, they are also asked to make a design recommendation to address the problem. Usability tests generate a lot of qualitative and quantitative data, so as a best practice a supervisor should provide an intern with a template to highlight the most important findings in a succinct manner. The sections of the template can include:

- A percentage breakdown of task completion
- A severity scale, labeling problems as catastrophic, serious, or minor
- Recommendations for each problem
- A trends section, which includes minor problems and positive trends

The internship supervisor provides examples of usability test reports, but interns are encouraged to find the most effective and economical way to present their findings and recommendations. Making the student responsible for their formatting and presentation of the data gives them more opportunities to be creative and stay engaged in the process. Supervisors encourage students not to write essays but to instead use images, summaries, and follow more of a poster presentation format. At the conclusion of the internship, interns deliver a presentation to library staff about their experience, which includes their findings and recommendations. The interns also field questions from library staff about their projects.

Closing the loop

Although students have provided recommendations to address a usability issue, the short timeline for the internship usually does not allow them to test their design enhancements or other recommendations. This three-stage internship cycle (*discovery*, *understanding*, *creating*) is missing the *test* stage of the design cycle. However, the *test* stage can be resumed by a subsequent intern or librarian to close the loop. One might follow up by conducting a survey, usability test, or other assessment method to determine whether a recommendation was effective.

Developing a UX internship

Preparation Time

Internship content preparation follows the stages of the internship: *discovery*, *understanding*, and *creating*. Creating content for the *discovery* stage is arguably the most demanding task, requiring an institution to pull internal data from various sources and introduce the intern to the concepts of UX. The intern's project choices may require the supervisor to change the content about methods in the *understanding* stage. The final stage requires a supervisor to provide templates for reporting, expectations for the finished project, and guidelines for delivering recommendations.

Creating the first internship could take 12 to 16 hours of preparation. Supervisors can do around one hour of work daily for two to three weeks to have enough material for their first internship. Established internships require substantially less time (2 to 4 hours), as a supervisor may continue to update materials, messaging, and expectations for deliverables based on internship feedback. Supervisor participation with an intern can vary based on the supervisor's preference and the intern's needs. During the *discovery* stage, a supervisor may meet with an intern for 15to 30 minutes daily. In the *understanding* stage, a supervisor can meet less frequently but needs to spend around an hour reviewing the intern's work, providing suggestions, and requesting revisions. During the *creating* stage, an intern works independently to write reports and recommendations and generate design improvements. Usually, two 30-minute meetings during this final stage suffice. These are rough estimates and an institution's needs and context could require more or less time.

Discovery Stage: Gathering Materials

Before beginning a project, an intern needs to know as much as they can about how users interact with the library website and services. Library staff should gather all of the materials available that show user activity with the website, building, interfaces, collections, library services, or other relevant parts of the library. This material will form the basis for the *discovery* stage of the internship. This can include but is not limited to:

- Google Analytics
- Heat map data, showing click or scroll activity on webpages
- Survey data
- Reference questions from patrons (question content and question types, tracked internally in a database, Google Docs or elsewhere)
- Logs or transcripts from chat software

Interns may not be familiar with analytics data and associated jargon, so providing readings can give some direction and context for their value and use. Suppose an institution does not have data on user activity. In that case, student employees in the library or instruction librarians can provide insights about users' preferences, popular web pages, or tasks that are confusing to users.

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Understanding Users and Allowing Project Types to Determine the Methods

After completing the *discovery* stage the next stage of the internship seeks to understand users' behaviors, motivations, perceptions, and goals. Deciding on a project will sharpen the internship learning goals and determine the method the intern will use in this stage. The internship supervisor should suggest appropriate methods to study, practice, and apply in a project. Establishing the intern project as confirmatory or exploratory simplifies which methods are appropriate. Christian Rohrer's "When to Use Which User-Experience Research Methods" is an excellent guide to determining the project type and method.[19]

Exploring fixes to known problems may be categorized as confirmatory research, while using methods strategically to discover new problems may be categorized as exploratory research.[20] Confirmatory research targets specific platforms, web pages, concrete tasks, and processes that library staff know are confusing or problematic to users. Confirmatory research is also commonly called evaluative research because it tests or evaluates the existing design of a product or service. To surface confirmatory projects an institution should ask:

- What have we heard complaints about?
- What services, interfaces, language, or processes do we know confuse people? (for example, Interlibrary loan or renewing a book)
- What platforms need testing? (e.g., discovery system, A-Z database list)

In simpler terms, these projects explore problems in which a user struggles to, or cannot, complete a task or one in which they cannot find a particular resource or page to complete a task. For the "struggles to, or cannot, complete a task" category of projects the method of think-aloud usability testing is beneficial. Designing a set of tasks for students to complete on an interface while thinking out loud under observation from an intern can surface pain points and provide insights. This method can help learn about users' behavior, specifically where the design is not allowing a user to complete a task. Usability testing is an excellent experience for an intern even if the testing is done with three tasks. For a micro-internship, there are shorter versions of usability tests such as guerrilla usability tests, which can target known problems. Using this method is shorter and simpler because participants are not recruited in advance and there are fewer tasks than in a classic usability test [21]

Interns recruit usability testing participants in person by introducing themselves and explaining the purposes of the internship and the usability test. They ask participants whether they have time and interest in participating. Approaching students is difficult for some interns, but they are given a pitch template and time to practice, which they report as helpful. The pitch template is partially adapted from Matthew Reidsma's document plan for conducting usability testing and is also available at (https://libguides.hollins.edu/internship/ux).[22] Interns look for higher-traffic areas to conduct recruitment, including the dining hall, the library, and buildings with active classrooms during the semester.

Usability testing with five users typically suffices according to Jakob Nielsen.[23] This small user pool grants time to write reports, generate recommendations, or learn about a new method to explore their project. Confirmatory research is beneficial, but there may be usability issues a library does not know about or has not heard about from users, so dedicating a portion of the internship to exploratory research provides a balance.

In contrast to confirmatory research, exploratory research pursues a research question using different methods and leads to a hypothesis or problem statement at the end of the process. Exploratory research is broad and, while it does carry the agenda of learning about users, this approach does not target specific tasks or features of websites. Exploratory research is also commonly called generative research because it generates ideas by gaining an understanding of users' real-world tasks or needs. Exploratory projects are wider, inclusive, and allow users to shape the direction of a project. Exploratory projects may include broader research questions such as:

- How do students begin their research?
- How do students select or use databases?
- How do students seek help?
- How do students find full text?

With broad and exploratory questions an interviewing or observation method is appropriate. Exploratory projects provide qualitative data and can answer larger questions. Exploratory project findings could lead to a marketing push for certain resources or integration of those resources into a learning management system, library instruction, or elsewhere. Exploratory projects can also surface broader trends of user behavior, which can inform how a library conducts instruction, how a library decides which finding aids are necessary, and more generally how a library can meet users at their point of need.

Despite the differences in the categories, an internship can include a project that has both an exploratory and confirmatory nature. Given a longer time frame, an intern could discover a hypothesis from an exploratory project, create and implement a recommendation, and then test the recommendation in a confirmatory project.

Selecting Learning Resources

Another building block in the internship is selecting UX resources. Avoid assigning scholarly articles to an intern's reading list as a best practice. Most scholarship on UX is not geared toward practitioners, so selecting resources with instructive, actionable content, including videos or guides to conducting fieldwork are more beneficial. Supplement succinct readings or resources with reflection prompts to ensure interns internalize important concepts, such as best practices for each method, and ensure that these prompts acknowledge scenarios that illustrate when to avoid using each method (See https://libguides.hollins.edu/internship/ux for an example of resources and prompts for interviewing.). In previous internships, students tracked down scholarship related to usability issues in academic libraries, summarized the findings, and then proposed how they would approach a similar project at Hollins University. In their journals, interns also shared feedback that the language of scholarly articles was dense and confusing.

Time Frame

The 2020, 2022, and 2023 internships lasted between five and ten days each. This compressed time frame meant focusing on what is essential, namely a strong foundation for an intern to begin their own fieldwork or projects. Covering two methods in a week is feasible, but internship supervisors must gauge the disposition of the intern. There may be circumstances outside of their control, such as lack of participants, an intern's working style, or demands outside of the internship that limit how many methods can be covered in a week, or over the duration of the internship. Table 2 provides a rough guideline to structuring a one- or two-week internship. If an internship lasts more than two weeks, the last stage (*creating*) should last longer than two days to give the intern ample time to complete this stage.

Intern work

Three J-Term internships used this model and structure. The interns have given the author permission to display and link out to their work for this article. Artifacts from these internships, such as draft questions, usability reports, and visualizations are available at the library UX internships page (see https://library.hollins.edu/uxinternship/).

J-Term 2020

In the fall of 2019, the library moved from a reference desk model to a consultation model for reference service. That fall the author selected scheduling software and created a page that offered library users the ability to find the appropriate librarian by subject, by name, or to request an appointment if unsure which librarian or subject to select. This project was confirmatory in nature and targeted the process of students making an appointment with a librarian.

Table 2.

Internship time frame

Days one-two Introduction to UX	Day three onward (understanding users with methods)	Last two days (creating)
Introduction to UX Discovery stage (learning about users' activity)	Readings and Reflection on Methods • First day of methods interns will: read, reflect, create the first draft of method material, critique it, and submit it to the internship supervisor for review • On the following day they begin collecting research • Repeat the process as internship length permits	Analyze data and create reports, recommendations, and prepare for the presentation

The J-Term 2020 internship was an opportunity for the intern to discover and gather qualitative feedback about the software for scheduling appointments with a librarian, test the design of the "get-help" page where the software was linked, and learn how best to display this option on the library website. On the "get-help" page of the website, librarians wanted students to select their librarian from dropdown menus, which were organized by name or subject area, and their selections were passed to the software scheduler. There was also a form embedded in the middle of the page for students who were not sure which subject or librarian to choose. The *understanding* stage of the internship involved the intern testing the prototype page with usability tasks for students. The intern found students were ignoring the dropdown menus and using the form in the middle instead of selecting the appropriate librarian by subject or name. In the *create* stage of the internship, the intern proposed a different design that featured the drop-down menus more prominently and changed the embedded form to a less conspicuous hyperlink (see Figure 1).

This internship project was substantial and impactful because the "get-help" page was the library's digital door to connecting with librarians and an integral part of the shift to a consultation model of service. The intern's work, specifically the testing and feedback of the design on the "get-help" page, ensured a smooth rollout and transition to the consultation model (See Table 3).

Find your Librarian

Subject:

Go

Librarian by Name

Name:

Go

Unsure what to do? Use the form below and we'll match you with a librarian.

School Logo

Use this form to schedule a research consultation with a librarian or report a technology problem. This service is reserved for current students, faculty, and staff at Hollins University and appointments are available Monday – Friday.

Full Name

Schedule an appointment with a Librarian

Meet with us virtually or physically in the library

Questions? Find your Librarian

Subject:

Go

Librarian by Name

Name:

Go

Unsure what to choose? Use the form below and we'll match you with a librarian.
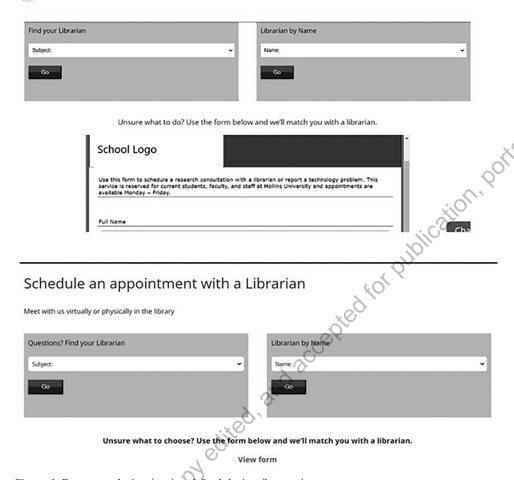
View form

Figure 1. Prototype design (top) and final design (bottom).

To close the loop and test the design recommendation, each student who booked a reference appointment during the spring semester was asked to fill out a survey asking what they found easy or difficult about scheduling an appointment. In this case, librarians administered the survey to follow up on the work completed by the intern. Students provided overwhelmingly positive comments about the layout of the "get-help" page, scheduling availability, and integration with their own outlook calendar.

J-Term 2022

The library created a new location for Young Adult New Adult fiction (YANA) during the summer of 2021. Library staff identified titles in the general collection that would be appropriate for YANA, designated a new physical location in the building, created a new location code and name for these items in the system, and moved them to a location discrete from the general collection. The library also began more actively purchasing YANA titles in the fall of 2021.

Table 3.
Overview of J-Term 2020

J-Term 2020	METHODS	(Understand) RESULTS
Focus: Ask a Librarian service	Usability testing, design prototyping, surveys (in subsequent semester)	**Findings:** Students focused more on embedded form instead of using dropdown options for librarians by subject
Goals: Assess usability of 3rd party appointment software and observe how students make appointments on the library's "get-help" page.		**Successes:** Testing of prototype page led to an improved page design.

The J-Term 2022 intern had a strong interest in YANA. The *understanding* stage of the internship was confirmatory research to determine awareness and findability of this collection. Usability testing would explore these questions, so usability test tasks focused on this collection. The usability tasks included asking students to locate specific YANA titles in the library. The intern's goal was to boost awareness of the YANA collection and gauge whether students knew they could submit suggestions for purchase for this collection. Most students did not know how to suggest a title for the library to purchase. In the *create* stage of the internship, one of the intern's recommendations was to place the purchase suggestion form in the services dropdown menu and to revise the name of the purchase suggestion page, so the page's purpose was clearer to students.

YANA fiction was an area that resonated with the intern's values, and they demonstrated this through their insistence on creating a clear channel for students to suggest books, enabling student selections to grow a collection that reflected their interests and tastes. At the conclusion of the UX section of the internship, the intern continued building awareness of this collection (see Table 4). They created a YANA student book club, Instagram account, and flyers to promote the collection and build a community around it. To close the loop and test their design recommendation for the purchase suggestion form, the author ran first click user testing in the spring semester and discovered that most students looked for the purchase suggestion form in the help dropdown menu. First click user testing is a technique in which the facilitator asks a participant the first place they would click on a web page to find a specific resource, tool, or web page.

J-Term 2023

The J-Term 2023 intern goal was to understand how students begin their research, where they look for sources, and how they evaluate sources (see Table 5). This project was exploratory and did not target a specific resource initially. For the *understanding* stage of

Table 4.
Overview of J-Term 2022

J-Term 2022	METHODS (Understand)	RESULTS
Focus: Building awareness of the Young Adult New Adult (YANA) and how students can contribute suggestions **Goals:** Gauge student awareness and the general findability of this collection. Provide a channel for students to make purchase suggestions.	Usability testing, first click user testing (in subsequent semester)	**Findings:** Students did not know how to submit a purchase suggestion to the library. **Successes:** Improved placement and description of the purchase suggestion form based on users' preferences.

the internship, the intern studied interviewing tactics and included many follow-up and probing questions. The intern also had an alternative script or direction if their opening questions did not elicit a substantial response. The questions included multiple points of inquiry, including students' opinions or perception of research tools, but these research tool prompts were only used if a student mentioned a specific research tool, such as the library's discovery system. In this way, the interview was designed to be exploratory and open, responding to the topics and interests of the students being interviewed and not directing a student to talk about a particular research tool.

The nature of the project was exploratory and confirmatory. The latter half of this internship targeted LibGuides and gauged students' awareness and perceptions of them. At the conclusion of the interview there were specific prompts about LibGuides. The interviews revealed that students had low, if any, awareness of LibGuides. The students who were aware of LibGuides said they found them useful, but these same students did not mention them as starting points for research. Moreover, many students did not know where to find LibGuides. The interviews also revealed confusion about the naming of these guides, because the library website calls them course guides and subject guides in some instances.

Card sorting was the second method employed in the *understand* stage to determine whether LibGuides' organization (pages, categories) made sense to students. While conducting card sorting, the intern explored whether the librarians' organization of LibGuides matched students' expectations. For example, librarians often organize guides

based on the stages of research, using "Getting started" as a top page and then providing pages for later in the research journey. Librarians also group resources in separate pages by purpose (such as reference or historical sources) in LibGuides. The intern found that students were more likely to organize LibGuides by media type, preferring separate pages for books, articles, and films. The 2023 intern project was unique because it began with an exploratory component by asking students about how they begin research, but also included a separate confirmatory component by asking a different set of students to conduct card sorting on a particular LibGuide.

The intern displayed their creativity during this internship by preparing multiple prompts during the interview and selecting follow-up prompts based on the participants' responses. In the *creating* stage, the intern also created data visualizations showing where students begin their research using bar graphs and illustrated the results of the card sorting method using a pie chart. The strongest recommendation during the *creating* stage was to make LibGuides more discoverable, specifically when searching with Google.

These findings led to librarian discussions on the purposes of different LibGuides, which could include subject guides or specific course guides with course-topic related resources. The multiple purposes of the guides supported the confusing naming of these guides as course guides and subject guides.

Arguably the most important finding from the *understand* stage of the internship was the difficulty students had finding LibGuides. After the internship, the author added the library's LibGuides URL to Google Search Console and Bing Webmaster, so the guides were easily discoverable when searching for "Hollins University LibGuides."

Benefits

The interns featured in this case study completed a survey at the end of the internship and one of the questions asked, "What specific tasks, skills, or ideas do you hope to carry with you?" The Institutional Review Board approved the sharing of survey results. Interns cited the benefits of:

- Learning about website design that is inclusive and intuitive
- Teamwork
- Learning transferable skills
- Exposure to different departments in the library

An intern's post-internship response illustrated a recognition of UX principles in web design:

> I will also take what I learned from doing testing on the library's website with me, because I learned a great deal about what people find easy to use on websites, which I see now in my job post-grad, dealing with a website that people find difficult to use because it isn't intuitively designed.

While the survey did not include a question specifically about engagement and autonomy, one of the questions asked, "Do you feel that the daily tasks of the internship connected into a coherent whole, or not? Please explain your answer." One of the intern's responses demonstrated the importance of personalization and its connection to engagement:

Table 5.
Overview of J-Term 2023

J-Term 2023	METHODS (Understand)	RESULTS
LibGuides – are they in your toolbox? **Goals:** Learn students' research processes (How do they start? Where do they go?) and tools (databases, Google, and so on) they use for research. Are they aware of LibGuides?	Interviews, card sorting	**Findings:** Students are generally not aware of LibGuides and do not mention them as a starting point for research. **Successes:** Making LibGuides more discoverable when searching different browsers, confirming librarian organization of LibGuides generally matched students' expectations

> Yes, I did! I was able to pick the main projects I did, so the tasks given to me were all based around my interests, and I never felt like I had chosen wrong or found something disappointingly unrelated.

Another survey question did not ask directly about autonomy but asked, "Do you feel you received sufficient guidance and examples, or too much?" One of the intern's responses illustrated their ability to work autonomously:

> I feel that I received a good amount of guidance from my supervisors, who allowed me to work self-sufficiently but also checked in with me relatively frequently, and I received a good amount of examples, especially for conducting the testing on the library's website, and seeing examples of other websites so that I could have some sort of comparison.

The final survey question read, "Other comments: all feedback is welcome! Use this space to tell us anything we haven't asked about:" This response illustrated the internship model's success in fashioning the content to the intern's interests:

> This internship was very well suited to my interests as someone who is working towards in a career in libraries, and I think that because it was so customizable and some of the skills I learned are so versatile it has a lot to offer that can transfer to other fields, which is really useful! I had an excellent j-term with the library!

The feedback and data collection about benefits for interns in this scenario is limited, and the questions asked were more general. However, an institution could craft survey or interview questions that gauge an intern's sense of engagement, autonomy, and opinion about whether the internship was well-balanced in terms of challenge and support.

Academic libraries as internship sites provide benefits. Libraries can provide a closer-to-real-world experience with student-driven and student-led projects. These projects build transferable skills and workforce preparedness and allow an intern to witness the impact of their work. Interns can see their design decisions or rollout of new services operationalized, potentially benefitting future library users. The internship also provides a framework for interns to approach a problem (*discovering*, *understanding*, and *creating*), which can be

> **Interns can see their design decisions or rollout of new services operationalized, potentially benefitting future library users.**

applied in any library or industry. The possibilities of creating mini portfolios for internship work, presenting their findings to an audience, and fielding questions about their projects is strong preparation for job interviews. The findings in this case study are valuable to library administrators, career centers interested in creating more on-campus internships, and other academic administrators.

Discussion

This study's goal was to provide a structure, an adaptable time frame, an explanation of best practices to keep interns engaged, and highlight results and findings of undergraduate UX internships in a mini-portfolio format. The case studies and intern feedback presented indicate that usability projects are not only possible, but potentially enjoyable, in a short time frame using this three-stage model. The model equips an intern with the skills necessary to pursue a library usability project that engages their interests and values. Academic libraries are service-oriented organizations charged with boosting campus awareness of their resources and staff for academic support. A UX internship is a natural fit to support a library's mission, and enlisting students as interns is useful alongside traditional marketing and classroom instruction. The students featured in this case study illustrate what is possible in a brief time, and this report fills a gap in the literature, demonstrating how and what undergraduate students can accomplish in a user experience internship in an academic library.

Assessment and Limitations

To date, this internship model lacks a formal assessment, outside of the evaluation form required by the Hollins University Career and Life Design Center and a short survey created by the supervisor. The short time frame of the internship posed assessment limitations. Assessing a project's handling of the identified usability issue during the internship is not possible. A five-to-ten-day internship does not allow an intern the time to implement their recommendations and revisit the usability issue to see whether there were any resulting improvements. However, a supervisor could begin assessment after a semester has passed, collecting data, or directing a subsequent intern to run similar tasks in a usability test. These are longer-term investments.

A shorter method of assessment is asking two questions after the micro-internship to assess a specific intern or usability project:

- Did the project lead to new findings about our users?
- Did the intern make recommendations that are novel, actionable, or lead to different practices?

Aside from time and assessment limitations, the internships can also generate recommendations beyond a library's scope or capabilities. Interns may recommend a change to vendor software that is beyond a librarian's ability to customize. Interns may also recommend an orientation on a specific library topic for all first-year students, which is not feasible, given the schedule and curriculum. Conversely, the intern may generate feasible project ideas. In this case, the supervisor can share these ideas with library staff and discuss a project action plan. As mentioned, per an intern's recommendation the author added our LibGuides URL to Google Search Console and Bing Webmaster, so the guides were easily discoverable when searching "Hollins University LibGuides." Student-generated ideas that result from internships benefit the library and can guide librarians' initiatives and outreach.

> **Student-generated ideas that result from internships benefit the library and can guide librarians' initiatives and outreach.**

Ideally, an internship supervisor can explain the library's limitations as a department and this understanding can lead to achievable recommendations. At the same time, the internship supervisor needs to cultivate an air of openness and possibility, so students feel comfortable making suggestions, however bold.

Moreover, there are limitations and potential biases in how interns provide feedback about their internship experiences. Interns know that librarians are reading their journal reflections and survey responses, which may influence how they respond. Additionally, Hollins University only hosted one UX intern at a time during J-Terms, so the sample size of intern experiences and outcomes are limited.

This case study's deliverables were mini portfolios. They were created using slides from the interns' final presentations and additional contextual slides provided by the author, which gave the mini portfolios the structure of a UX portfolio showing a problem statement, thinking process, methods, results, and conclusions. These 2020, 2022, and 2023 mini portfolios do not provide the viewer with an opportunity for a deeper dive into the project. With more time and structure an intern could create a richer portfolio, which could link to additional data collected, and provide more artifacts such as the entirety of their interview questions, summaries, and so on. A more comprehensive portfolio requires more time and could demonstrate skill acquisition and project management to employers, and an intern could include this more fulsome portfolio on their LinkedIn profile.

Conclusion

This case study's goal was to provide a structure, best practices, sample reading list, and approach that delivered tangible results in UX micro-internships. The findings support the idea that an academic library can serve as a model environment for conducting

student-led UX work. This internship model was developed at a smaller institution with limited staffing and can be expanded for a longer internship, employing more methods, in any library setting. This model can address known problems or allow an intern to explore library user behavior more broadly. This micro-internship has an iterative quality, so the findings and experiences of one intern connect with a future project. For example, subsequent interns may test previous interns' recommendations for what should be tested next, based on their findings. Internship supervisors can then add intern-generated projects to their project list. Regularly scheduled micro-internships keep libraries in touch with the behavior of their users, add transferable skills and artifacts for interns, and build goodwill on campus. Providing a UX internship demonstrates a library's care and concern for users and gives students a unique opportunity to learn about a career field, which may not be available to them at their institution.

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